Dr. Laura E. Waters
Department of Earth & Environmental Science
801 Leroy Place, Socorro, NM 87801
Email: laura.waters@nmt.edu
Phone: 530-574-7550

Curriculum Vitae

August 2025

Education

2013	Ph.D. Geology, University of Michigan, Ann Arbor Dissertation: The Effect of Degassing of H_2O on Crystallization and Oxidation in Highly-Evolved Magmas: Implications for the Origins of Rhyolite Liquids *(Advisor: Rebecca A. Lange)*
2008	B.S. in Geology, Juniata College, Huntingdon, PA *Cum Laude*

Positions Held

2025-present	Associate Professor, New Mexico Institute of Mining and Technology, Socorro, NM
2020-2025	Assistant Professor, New Mexico Institute of Mining and Technology, Socorro, NM
2017-2019	Assistant Professor, Sonoma State University, Rohnert Park, CA
2017-2018	Project Director, Keck Geology Consortium Project: Hazards in the Caribbean: The history of magma chambers, eruptions, landslides, streams, and fumaroles in Dominica (Keck Frontier Project)
2017-2018	Postdoctoral Fellow, Smithsonian Institution, DC Project: **"**Continental Nursery at Buldir Volcano, Western Aleutian Arc, Alaska, USA**"** Advisor: Elizabeth Cottrell
	Project: "Origin of Crystal Poor Intermediate Magmas from South Sister" Advisor Benjamin Andrews
2015-2016	Buck Postdoctoral Fellow, Smithsonian Institution, DC Project: "Ascent Rates of Obsidians: Experiments and New Model Speedometer" Advisor: Benjamin Andrews
2014	Postdoctoral Fellow, University of Michigan, Ann Arbor Project: "Experimental study of the dependence of Fe-Mg partitioning between orthopyroxene and rhyolite melt on dissolved melt H_2O concentration" Advisor: Rebecca A. Lange

Professional Honors

2019-2020	Mineralogical Society of America Distinguished Lecturer

Research Experience

Publications

Bell, A. **Waters, L.E.**, Ghiorso, M. (submitted) High-Pressure Clinopyroxene in Northwest Africa 12774 and New Geobarometric Evidence for a Planetary Embryo-Sized Angrite Parent Body. Earth and Planetary Science Letters.

Scholten, O.*, **Waters, L.E.**, Zimmerer, M., Wang, S. (submitted) Geochemistry and Petrology of the Taos Plateau Volcanic Field in New Mexico: mantle heterogeneity beneath the Rio Grande Rift and Jemez Lineament. Journal of Volcanology and Geothermal Research.

Banerjee, D.*, **Waters, L.E.,** Hurtig, N.C., Gysi, A.P., Harlov, D., Zhu, C., Migdissov, A. (in review) Mobility of heavy rare earth elements in magmatic-hydrothermal systems: Experimental determination of $DyPO_4$ solubility in supercritical fluids. Chemical Geology.

Skocko, N.E.*, **Waters, L.E.,** Zimmerer, M. (in review) Effects of Glacial Loading and Unloading on Magmatic Storage Conditions Beneath Mt. Waesche Volcano Marie Byrd Land, Antarctica. Journal of Petrology.

Grismer, M.*, **Waters, L.E.,** Moore, G.M., Farfan, G.A. (2025) Efficacy of assessing magmatic storage depth using natural samples, experiments and models: a case study from Valles Caldera, NM (USA). Geochemistry, Geophysics, Geosystems. https://doi.org/10.1029/2025GC012241

Reece, M.E., Migdisov, A.A., Williams-Jones, A.E., Strzelecki, A.C., **Waters, L.E.**, Boukhalfa, H., Guo, X. (2025) The Complexation of Neodymium in Carbonate-Bearing Solutions from 100-600°C. Nature Communications Earth & Environment. https://doi.org/10.1038/s43247-025-02334-w

Banerjee, D.*, **Waters, L.E.,** Hurtig, N.C., Gysi, A.P., Harlov, D., Zhu, C., Migdissov, A. (2025) Hydrothermal experiments at 500 to 700 °C and 1.5 kb: Insights into monazite-(Nd) solubility and aqueous speciation of Nd in supercritical fluids. Geochimica et Cosmochimica Acta. https://doi.org/10.1016/j.gca.2025.01.004.

Andreys, J., Cottrell, E., Kelley, K.A., **Waters, L.E.,** Coombs, M.L. (2024) Insights on Arc Magmatic Systems Drawn from Natural Melt Inclusions and Crystallization Experiments at PH2O = 800 MPa under Oxidizing Conditions. *Journal of Petrology, 65* https://doi.org/10.1093/petrology/egae117.

Bell, A, **Waters, L.E.**, Ghiorso, M. (2025) The Olivine-Spinel-a^{melt}_{SiO2} (OSaS) Oxybarometer: A New Method for Evaluating Magmatic Oxygen Fugacity in Olivine-Phyric Basalts. American Mineralogist. https://doi.org/10.2138/am-2023-9021.

Grismer, M.*, **Waters, L.E.** (2024) Petrogenesis of the Post-Collapse Rhyolites, Valles Caldera, NM for *Volcanica*. https://doi.org/10.30909/vol.07.01.303333.

Waters, L.E. (online, Nov 2023). Geochemical Modeling. In: Treatise on Geochemistry, 3rd edition (Ed. Anat Shahar) https://doi.org/10.1016/B978-0-323-99762-1.00017-6

Waters, L.E., Andrews, B.J. and Frey, H.M. (2021) Daly Gaps at South Sister Volcano, Oregon, USA generated via partial melting. *Contributions to Mineralogy and Petrology,* 176. https://doi.org/10.1007/s00410-021-01805-5

Waters, L.E., Cottrell, E., Coombs, M.C. and Kelley, K. (2021) The effect of oxygen fugacity on the calc-alkaline liquid line of descent in the Aleutian Arc: A petrologic and experimental investigation of hornblende-bearing basalts from Buldir Island, AK. *Journal of Petrology, 62.* https://doi.org/10.1093/petrology/egaa104

Cottrell, E., Birner, S., Brounce, M., Davis, F.A., **Waters, L.E.** and Kelley, K.A. (In Press, published online Aug 2020). Oxygen Fugacity Across Tectonic Settings. *AGU Geophysical Monograph Redox variables and mechanisms in magmatism and volcanism.* Eds: D. R. Neuville and R. Moretti, Wiley. https://doi.org/10.1002/9781119473206.ch3

Waters, L.E. & Frey, H.M. **(**2018**)** Crystal-poor rhyolites and rhyodacites from Volcán Tepetiltic, Mexico: Evidence for melt formation, crystallization and eruption over short timescales. *Journal of Volcanology and Geothermal Research* 361, 36-50. https://doi.org/10.1016/j.jvolgeores.2018.08.003

Waters, L.E. and Lange, R. A. (2017) Why aplites freeze and rhyolites erupt: controls on the accumulation and eruption of high-SiO_2 (eutectic) melts. *Geology* 47; 1019-1022. https://doi.org/10.1130/G39373.1

Waters, L.E. and Lange, R. A. (*2017)* An experimental study of $^{Fe2+-Mg}K_D$ between orthopyroxene and rhyolite: a strong dependence on H_2O in the melt*. Contributions to Mineralogy and Petrology* 172, 42. https://doi.org/10.1007/s00410-017-1358-9

Crabtree, S.M. and **Waters, L.E.** (*2017)* The Petrologic History of the Sanganguey Volcanic Field, Nayarit, Mexico: Comparisons in a suite of crystal-rich and crystal-poor lavas. *Journal of Volcanology and Geothermal Research* 336: 51-67**.** https://doi.org/10.1016/j.jvolgeores.2017.02.005

Waters, L.E. & Andrews, B.J. (*2016*) The Role of Superheating in the Formation of Glass Mountain Obsidians (Long Valley, CA) inferred through Crystallization of Sanidine. *Contributions to Mineralogy and Petrology* 171, 79 (1-19). https://doi.org/10.1007/s00410-016-1291-3

Waters, L.E. and Lange, R. A. *(2016)* No effect of H_2O degassing on the oxidation state of magmatic liquids. *Earth Planetary Science Letters.* 447, 48-59. https://doi.org/10.1016/j.epsl.2016.04.030

Waters, L.E. and Lange, R. A. (*2015)* An updated calibration of the plagioclase-liquid hygrometer-thermometer applicable to basalts through rhyolites. *American Mineralogist,* 100, 2172-2184. https://doi.org/10.2138/am-2015-5232

Waters, L. E., Andrews, B. J., and Lange, R. A. (*2015*) Rapid Crystallization of Plagioclase Phenocrysts in Silicic Melts during Fluid-saturated Ascent: Phase Equilibrium and Decompression Experiments. *Journal of Petrology*, 56, 981-1006. https://doi.org/10.1093/petrology/egv025

Waters, L. E. and Lange, R. A. (2013) Crystal-poor, multiply saturated rhyolite (obsidians) from the Cascade and Mexican arcs: evidence of degassing-induced crystallization of phenocrysts. *Contributions to Mineralogy and Petrology* (special volume: Memorium to Ian Carmichael), 166, 731-754. https://doi.org/10.1007/s00410-013-0919-9

**Student publication*

Manuscripts in preparation

Waters, L.E. and Andrews, B.J. Along Strike Variation in Eruptive and Decompression Rates for Rhyolite-Obsidian Domes, South Sister Volcano, OR

Meeting Abstracts

Waters, L.E., Grismer, M.A. Banerjee, D., Hurtig, N., Gysi, A., Scholten, O., Wang, S., Harlov, D. (2025) Petrology– Who Needs It? Applications of Petrology and Experimental Techniques to Geohazards, Critical Minerals and Carbon Capture, Uptake and Storage. *Invited Talk.* Geological Society of America Fall Meeting. San Antonio, TX, USA.

Waters, L.E., Andrews, B., Skocko, N., Bindeman, I., Bell, A.S., Frey, H. (2025) Magmatic differentiation as the source of oxidation in Earth's continents: Perspectives from South Sister Volcano, OR, USA. Geological Society of America Fall Meeting. San Antonio, TX, USA.

Grismer, M.A., **Waters, L.E.**, Andrews, B.J. (2025) Crystallization kinetics of sanidine and anorthoclase in high-silica rhyolites: determining ascent rates for effusive rhyolites from Valles Caldera, NM, USA. Geological Society of America Fall Meeting. San Antonio, TX, USA.

Gysi, A. P., Huritg, N. C., Juan Han, H., **Waters, L. E.,** Harlov, D., Miron, G. D., Kulik, D. A., Migidssov, A.A., Zhu, C., (2024) A new perspective for improving the thermodynamic properties of rare earth elements (REE) aqueous complexes in sub to supercritical hydrothermal fluids. *Goldschmidt Conference. Chicago, Il, USA.*

Waters, L.E., Banerjee, D., Hurtig, N., Gysi, A., Harlov, D., Zhu, C., Migdissov, A. (2024) Isotope dilution methods in small experimental charges at high temperatures in cold-seal pressure vessels and applications. *Thermocon 2024. Socorro, NM.*

Waters, L.E. & Moore, G.M. (2023) Kinetics of cooling-induced sanidine crystallization in rhyolites from Valles Caldera, NM. GSA Annual Meeting 2023. Pittsburgh, PA.

Gysi, A. P., Huritg, N. C., **Waters, L. E.,** Harlov, D., Miron, G. D., Kulik, D. A., Migidssov, A.A., Zhu, C., What controls the mobility of rare earth elements (REE) in critical mineral deposits in acidic vs. alkaline hydrothermal fluids?, Goldschmidt conference 2023, Lyon. (Oral Presentation)

Bell, A., **Waters, L.E.** (2022) Developing new tools to assess redox diversity in basalts and their mantle sources: A case study in the Rio Grande Rift. *GSA Cordillera Sectional Meeting 42-5*

Waters, L.E., Grismer, M. & Moore, G. (2021) Sanidine-Liquid Equilibrium: Phase Diagrams and Two Sanidine Hygrometers for Alkaline and Calc-Alkaline Liquids. *Fall American Geophysical Union Meeting, Abstracts with Programs V25A-84*

Andrews, B.J., **Waters, L.E.** (2021) Decompression rates of South Sister (Oregon, USA) obsidians from numerical modeling of plagioclase nucleation and growth. *Fall American Geophysical Union Meeting, Abstracts with Programs V33B-07*

Waters, L.E. (2021) *Invited Talk.* Conditions that give rise to efficient segregation and eruption of rhyolite-obsidians in the cascades: a petrologic study of rhyolites from Medicine Lake, South Sister, and Lassen. *Geological Society of America, Fall National Meeting*

Waters, L.E., Andrews, B.J. and Frey, H.M. (2020) *Invited Talk.* Daly gaps at South Sister Volcano, Oregon, USA generated via partial melting. *GSA Annual Fall Conference* INV10d: 783748

Frey, H., Lippitt, R., Manon, M. & **Waters, L.E.** (2020) Transition from Extension to Subduction Magmatism Recorded by Ignimbrites in Central Oregon. *Goldschmidt Conference.*

Van Wijk, J., Axen, G. J., **Waters, L.E.** (2020) Mid-crustal magma storage in a continental rift: insights from an actively forming sill complex. T046-04.

Waters, L.E., Grismer, M., Moore, G. (2019) A New K-Feldspar Liquid Hygrometer: Initial Experiments, Calibration and Application. *Fall American Geophysical Union Meeting, Abstracts with Programs* V51H-0135

Waters, L.E. and Andrews, B.J. (2018) Along Strike Variation in Eruptive and Decompression Rates for Rhyolite-Obsidian Domes, South Sister Volcano, OR. *Fall American Geophysical Union Meeting, Abstracts with Programs* V33B-07

Waters, L.E. (2017) Calc-Alkaline Liquid Lines of Descent Produced Under Oxidizing Conditions: An Experimental and Petrologic Study of Basaltic Tephras from the Western Aleutians, AK. *Fall American Geophysical Union Meeting, Abstracts with Programs* V11B-0343.

Frey, H.M & **Waters, L.E.,** & Manon, M. R.F (2017) Cold, Wet, and Deep: Andesite generation in Dominica, Lesser Antilles. *Fall American Geophysical Union Meeting, Abstracts with Programs* V43A-0514.

Waters, L.E. and Lange, R.A. (2016) An abrupt change in the magmatic source of rhyolite volcanism in Long Valley, CA recorded by pre-eruptive oxygen fugacities of the Early Rhyolites (Obsidians): Evidence of transition from subduction-modified lithosphere to asthenosphere. *Fall American Geophysical Union Meeting, Abstracts with Programs* V13D-2887.

N. G. Lunning, T. J. McCoy, C. M. Corrigan, and **L. E. Waters** (2016) Differentiation of relatively oxidized planetesmals: experimental partial melting of allende at IW+1. *Meteoritical Society*

Waters, L.E. & Andrews, B.J. (2015) Are All Obsidians Super-Heated? Insights from Observations of Crystallization Kinetics in Experiments on Glass Mountain Obsidians (Long Valley, CA) Oral Presentation V11F, *Fall American Geophysical Union Meeting, Abstracts with Programs*

Waters, L.E. & Lange, R.A. (2014) Evidence for an abrupt transition in the mantle-derived source to the Long Valley Caldera rhyolites after the climactic eruption: from subduction-modified lithosphere to asthenosphere. Poster Presentation, V33A, *Fall American Geophysical Union Meeting, Abstracts with Programs*

Lange, R.A. & **Waters, L.E. (2014)** Quantitative evaluation of the effect of H_2O degassing on the oxidation state of magmas. Oral Presentation, V52B, *Fall American Geophysical Union Meeting, Abstracts with Programs*

Waters, L.E. & Lange, R.A. (2014) The dependence of Fe-Mg partitioning between orthopyroxene and rhyolite melt on dissolved melt H_2O concentration, *Goldschmidt 2014 Conference Abstracts*

Waters, L.E., Andrews, B. & Lange, R.A., (2013) *Invited Talk.* Effects of changing H_2O concentrations and viscosities on plagioclase crystallization in a rhyolite obsidian: experiments and plagioclase speedometry, *Fall American Geophysical Union Meeting, Abstracts with Programs*

Student Meeting Abstracts

Skocko, N.E., **Waters, L.E**., Zimmerer, M. (2025) Compositional Variation and Storage Conditions Through Time at Mount Waesche, West Antarctica. Goldschmidt 2025. Prague, Czech Republic.

Grismer, M., **Waters, L.E.,** Moore, G.M., Farfan, G.A. (2024) Efficacy of assessing magmatic storage depth using natural samples, experiments and models: a case study from Valles Caldera, NM (USA). *Fall American Geophysical Union Meeting, Abstracts with Programs*. V34A-04

Scholten, O. **Waters, L.E.**, Zimmerer, M., Wang, S. (2024) Resource Assessment: Geochemistry and Petrology of the Taos Plateau and Raton Clayton Volcanic Fields. *CESAM. Socorro, NM.*

Kershaw, C.T., Hurtig, N.C., Gysi, A.P., Migdissov, A. **Waters, L.E.,** Harlov, D.E. (2024) The solubility and complexation of Ce, Y and Er in hydrothermal fluids at varying pH and salinity between 350 and 500 °C. *Goldschmidt Conference. Chicago, Il, USA.*

⋆Grismer, M., **Waters, L.E.,** Moore, G.M., Farfan, G.A. (2023) Conditions of two-feldspar saturation in a high-silica rhyolite: a comparison between phase equilibrium experiments and a rhyolite-MELTS phase diagram of a Valles Caldera obsidian. *Fall American Geophysical Union Meeting, Abstracts with Programs*. V33C-0167

Andreys, J., Cottrell, E., Kelley, K.A., **Waters, L.E.,** Coombs, M.L. (2023) Combined insights from whole rocks, melt inclusions, and crystallization experiments at hydrous, oxidized conditions reveal differences in recorded magmatic processes at Buldir. *Fall American Geophysical Union Meeting, Abstracts with Programs*.

Skocko, N.E., **Waters, L.E.,** Zimmerer, M.J. (2023) Geochemical and Petrologic Insights into Alkaline Magma Generation from Mount Waesche, Marie Byrd Land, Antarctica. Goldschmidt Conference. Lyon, France.

Banerjee, D., **Waters, L.E.,** Hurtig, N.C., Gysi, A.P., Harlov, D., Zhu, C., Migdissov, A. High temperature monazite-(Nd) solubility experiments to predict Nd complexation at variable pH and salinity in supercritical fluids. Goldschmidt conference 2023, Lyon.

Kershaw, C.T., Hurtig, N.C., Gysi, A.P., Migdissov, A. **Waters, L.E.,** Harlov, D.E. (2023) The solubility of ErPO4 in hydrothermal fluids at varying pH and salinity between 350 and 450°C. Goldschmidt Conference. Lyon, France.

Chavez, A., Baca, C., **Waters, L.E.,** Zimmerer, M. (2022) Geochemistry and Petrology of Alkaline Magmas from Mt. Waesche, Antarctica. *Fall American Geophysical Union Meeting, Abstracts with Programs* V12C-0051.

Woodard, M., Iverson, N. A. **Waters, L.E.,** Macklemore, V.T. (2022) Reevaluating the Emplacement History of the Cornudas Mountains. *Fall American Geophysical Union Meeting, Abstracts with Programs*

Woodard, M., Iverson, N. A. **Waters, L.E.,** Macklemore, V.T. (2022) Re-evaluating the emplacement history and tectonics of the Cornudas Mountains, southern New Mexico GSA Annual Meeting 41-10.

Banerjee, D., **Waters, L.E.,** Hurtig, N., Gysi, A., Harlov, D., Migdissov, A. (2022) Effect of fluid chemistry on the solubility of monazite-(Nd) and Nd speciation in high temperature and pressure supercritical aqueous fluids. *Goldschimdt 2022. Poster #262.*

Grismer, M., **Waters, L.E.** (2021) The Petrology and Pre-Eruptive Conditions of the Valles Caldera Resurgent Domes. *Fall American Geophysical Union Meeting, Abstracts with Programs V33B-06*

Thomson, K. & **Waters, L.E.** (2019) Creating a Stratovolcano: Petrogenesis of the cone-building lavas of South Sister Volcano, OR. *GSA Cordilleran Section-115th Annual Meeting.*

⋆Zander, P. & **Waters, L.E.** (2019) Mercury Deposits of Northern California. *GSA Cordilleran Section-115th Annual Meeting.*

Bedoyan, L.A., **Waters, L.E.**, Nicolaysen, K.P., Wilner, M., and Humphreys, E. (2019) Pre-eruptive conditions and melts modeling of magmatic densities for Imnaha and Powder River olivine basalts. GSA Cordilleran Section-115th Annual Meeting.

Dupuis, K.E., Anfinson, O.A., **Waters, L.E.**, Frey, H.M., Rico, M., Richardson, K.J., Camarena, G. (2019) The provenance of wine: the role of bedrock and soil in transferring Trace and rare earth elements into wine grapes, Sonoma County, CA GSA Cordilleran Section-115th Annual Meeting.

Zander, P. & **Waters, L.E.** (2018) Sonoma Volcanics, their weathering products and landslide susceptibility. Sonoma State University, School of Science and Technology Science Symposium.

Hughes, L. & **Waters, L.E.** (2018) Applications of Google Earth Imagery in Interpreting the Complex Eruptive History of South Sister Volcano. Sonoma State University, School of Science and Technology Science Symposium.

Thomson, K. & **Waters, L.E.** (2018) On the origin of stratovolcanoes: a petrologic study of intermediate magmas from South Sister Volcano. Sonoma State University, School of Science and Technology Science Symposium.

Williams-Meiding, B. & **Waters, L.E.** (2018) Assessing the origins of high-silica volcanism in the central Cascades: A petrologic study of the Tumalo Tuff. Sonoma State University, School of Science and Technology Science Symposium.

O'Campo, I.K. & **Waters, L.E.** (2018) Reassessment of plagioclase activity model and application to plagioclase-liquid hygrometry. Sonoma State University, School of Science and Technology Science Symposium.

Scherf, C. & **Waters, L.E.** (2018) An assessment of magma source variability for the Holocene Devil's Chain Obsidian Domes, South Sister Volcano, OR. Sonoma State University, School of Science and Technology Science Symposium.

Casaus, J.G., **Waters, L.E.,** Frey, H.M., & Manon, M. R.F. (2018) Evaluating changes in pre-eruptive conditions of explosively and effusively erupted intermediate magmas. Sonoma State University, School of Science and Technology Science Symposium.

Casaus, J.G., **Waters, L.E.,** Frey, H.M., & Manon, M. R.F. (2017) Evaluating changes in pre-eruptive conditions of explosively and effusively erupted intermediate magmas. AGU Fall Meeting, V43A-0517.

⋆Bersson, J., **Waters, L.E.** Frey, H.M., & Manon, M. R.F. (2017) Explosive to Effusive Transition in intermediate volcanism: an analysis of changing magma systems conditions in Dominica. AGU Fall Meeting, V43A-0516.

Vonsydow, K.R., **Waters, L.E.** Frey, H.M., & Manon, M. R.F. (2017) Evidence for Cold, Hydrouse Parental Magmas on Dominica: Petrology of the Foundland Basalts. AGU Fall Meeting, V43A-0522.

Moore, C.C., **Waters, L.E.** Frey, H.M., & Manon, M. R.F. (2017) Source of abundant volcanism of Dominica: an evaluation of potential mantle components. AGU Fall Meeting. V43A-0515.

Isenburg, T., Frey, H.M., **Waters, L.E.,** Dunn, S., Manon, M. R.F. (2017) Stratigraphy and Geochemistry of a Fond St. Jean Cinder Cone, Dominica. V43A-0520.

Ebner, N., Frey, H.M., Wirth, K.R., **Waters, L.E.,** Manon, M. R.F. (2017) Re-examining Distal Facies of the Grand Bay Ignimbrite at Fond St. Jean, Dominica. V43A-0519.

Ludlam, A. Frey, H.M. Manon, M. R.F., & **Waters, L.E.** (2017) Variations in Pleistocene effusive volcanism on Dominica, Lesser Antilles. AGU Fall Meeting. V43A-0521.

Hickernell, S., Frey, H.M., Manon, M. R.F., & **Waters, L.E.** (2017) Magma Mixing: Magmatic Enclaves in Morne Micotrin, Dominica. AGU Fall Meeting. V43A-0519.

⋆Student Poster Award

Grants and Awards

2025	REE fractionation through coupled hydrothermal REE-Cl/SO_4/CO_3 ligand complexation and mineral adsorption/solid solution interaction mechanisms (PI-Gysi, Co-I Waters, Hurtig) **(Notice of Award 07/2025; pending approval at Fed Level: DOE $2,500,000)**
2025	Earth's reservoirs and the energy transition: workforce training in numerical and experimental approaches to understand fluid storage, transport and reactions in the crust (PI-Waters, CoIs Bilek, Naliboff, Rinehart) **(Awarded: NSF EPSCOR-GFP-2500349: $954,000)**
2024	Collaborative Research: A Novel Solution Model for Igneous Biotite: Improving MELTS and the Biotite-Sanidine-Magnetite Thermobarometer/Hygrometer with New Experiments (PI-Waters, Co-I Hurtig) **(Awarded: NSF EAR-2427328: $465,220)**

2024 Equipment: MRI: Track 2 Acquisition of Modern Field Emission Electron Microprobe for current research and workforce development (PI-Iverson, Co-PI Waters, Co-PI Hurtig, Co-PI Chowdry)
(Awarded: NSF MRI-2408829: $1,775,439)

2023 Equipment: MRI: Track 2 Acquisition of Modern Field Emission Electron Microprobe to meet current research requirements and expand research direction (PI-Iverson, Co-PI Waters, Co-PI Hurtig, Co-PI Chowdry)
(Declined: $1,929,412)

2023 *New Mexico Child Care Supply Building Grant: Funds for Expanding Childcare to Include Children Under Two at New Mexico Tech
(Awarded: $385,000 to Division of Student Affairs, Authored by L.E. Waters)
**This award provided the first formalized care for children under two in Socorro, NM*

2023 Regional Resource Assessment for CO_2 Storage in New Mexico and Surrounding Areas: Identification, Characterization and Evaluation of in-situ Mineralization Site/Complex
(Awarded: DOE-FOA-0002614 $1,254,092; Co-PI Waters specific ~$140,000)

2022 Collaborative Research: Developing New Oxybarometers to Assess Redox Diversity in Holocrystalline the Basalts of the Rio Grande Rift and the Links to their Mantle Sources
(Declined: $302,239)

2021 Molecular complexation of rare earth elements (REE) in high temperature and pressure supercritical geologic fluids. *(*PI-Gysi, Co-PI Hurtig, Co-PI Waters)
(Awarded: DE-FOA-0002483; $1,800,000; Co-PI Waters specific ~$600,000)

2021 Integrating Petrologic Records and Geodynamics: Quantifying the Effects of Glaciation on Crustal Stress and Eruptive Patterns at Mr. Waesche *(*PI-Waters, Co-PI Naliboff, Co-PI Zimmerer)
(**Awarded: NSF-OPP-2122248; $483,028**)

2020 MRI: Acquisition of a modern variable pressure scanning electron microscope to support research, STEM education and outreach at New Mexico Tech
(Declined: $409,538)

2019 Collaborative Research: A New Sanidine-Liquid Hygrometer: Experiments, Calibration and Applications
(**Awarded: NSF-EAR #2022465; $135,782**)

2017 School of Science and Technology Innovation Initiative
"Petrographic Analytical Suite for the Geology Department"
(Awarded: $7000)

2017 Sonoma State University Norwick
"Sonoma Volcanics, their weathering products and landslide susceptibility"
(Awarded: $1500)

2017 Sonoma State University Koret
"Understanding the Origin of Earth's Continents: A Study of Silicic Magmas from South Sister Volcano, OR"
(Awarded: $4,000)

2017 Sonoma State University WATERS
"Sonoma Volcanics, their weathering products and landslide susceptibility"
(Awarded: $1,500)

2017 Assistant Director for Science Award
"*Linking Lava Morphology to Pre-Eruptive Conditions and Kinetics of Crystallization"*
(Awarded: $13,844)

2017 Smithsonian Scholarly Studies Award

"Understanding the Origins of Continental Crust: An Experimental and Geochemical Evaluation of the Role of Magma Mixing in the Formation of Crystal-Poor Intermediate Magma"
(Awarded: $65,668)

2015 Buck Postdoctoral Fellow, Smithsonian Institution, DC
(**Awarded: $106,000**; two years of postdoctoral funding)
Project: "Ascent Rates of Obsidians: Experiments and New Model Speedometer"
Advisor: Benjamin Andrews

Graduations

2025	Magdalen Grismer	PhD	(Los Alamos National Lab)
2025	Oscar Scholten	MS	
2023	Mason Woodard	MS	(NMT MTLS-SEM laboratory technician)

Graduate Student Research & Mentorship

2026	Teagan Skinner	MS student (NMT)	(Primary Advisor)
2025-present	Emily Yoder	PhD student (NMT)	(Primary Advisor)
2022-present	Noël Skocko	PhD student (NMT)	(Primary Advisor)
2022-present	Debarati Banerjee	PhD student (NMT)	(Primary Advisor)
2023-2025	Oscar Scholten	MS student (NMT)	(Primary Advisor)
2021-2023	Mason Woodard	MS student (NMT)	(Primary Advisor)
2020-2025	Magdalen Grismer	PhD student (NMT)	(Primary Advisor)
2020-2025	Jacob Gehtz	MS student (NMT)	(Academic Advisor)

Graduate Committee Membership

2024-present	Willa Obringer	MS Student
2024-present	Aadish Velmani	MS Student
2024-present	Sarah Moses	MS Student
2024-present	Jacob West	MS Student
2022-present	Charles Kershaw	PhD Student
2022-present	Kevin Padilla	PhD Student
2022-present	Yerko Figueroa Penarrieta	PhD Student
2020-present	Mackenzie Best	MS student
2020-2022	Madison Payne	MS student
2020	Morgan Nasholds	MS student

Undergraduate Student Research & Mentorship

2024-2025	Teegan Skinner (New Mexico Tech)
2022	Jack Sterrett (New Mexico Tech)
2021-present	Antonio Chavez (New Mexico Tech)
2021-present	Chris Baca (New Mexico Tech)
2021-2022	Julia Barnett (New Mexico Tech)
2020-2021	Kiersten Hottendorf (New Mexico Tech; Senior thesis; Now grad student UBuffalo)
2020-2021	Ashley Torres (New Mexico Tech; Senior thesis; Now at LANL)
2019-2020	Magdalen Grismer (Sonoma State; Senior thesis; NMT)
2019-2020	Eve Hostettler (Sonoma State; Senior thesis; UT Austin)
2018-2019	Ian Ocampo (Sonoma State; Senior Thesis; Princeton)
2018-2019	Kylie Dupuis (Sonoma State; co-advisor Senior Thesis; CalPoly)
2018-2019	Noel Skocko (Sonoma State; Senior Thesis; UMiami, OH)

2018-2019 Brennan Williams-Meiding (Sonoma State; Student Teaching Assistant)
2018-2019 Kate Thomson (Sonoma State; Senior Thesis)
2018-2019 Peter Zander (Sonoma State; Senior Thesis)
2018 Carly Scherf (Sonoma State)
2018 Lee Hughes (Sonoma State; now at New Mexico State U)
2017-2018 Justin Casaus, McNair Scholar (Senior Thesis; UMichigan)
2017-2018 Katie Vonsydow [CSU San Bernadino; CSUSB]
2017-2018 Jessie Berrson [Whitman College; Arizona State U]
2017 Chloe Moore [Amherst College]

Teaching Experience

New Mexico Institute of Mining and Technology *(number of students; rating out of 5)*
S2025 GEOL1190 Geology of the National Parks *(15; 4.7)*
F2024 GEOC5081 Chemical Dynamics of Magma *(2; unrated)*
F2024 GEOL3080 Igneous and Metamorphic Petrology *(5; 4.4)*
F2024 GEOC512 Principles of Geochemistry *(9; 4.5)*
F2023 GEOL3080 Igneous and Metamorphic Petrology *(7; 4.3)*
S2023 GEOL1190 Geology of the National Parks *(19; 4.78)*
F2022 GEOC512 Principles of Geochemistry *(13; 4.6)*
F2022 GEOL380 Igneous and Metamorphic Petrology *(5; 4.5)*
S2022 ERTH389 Volcanoes and Earthquake Hazards *(4; 4.7)*
F2021 ERTH380 Igneous and Metamorphic Petrology *(4; 5)*
F2020 GEOC589/ERTH390 Principles of Geochemistry *(13; 4.2)*
F2020 ERTH380 Igneous and Metamorphic Petrology *(4; 4.7)*
F2020 ERTH380 Igneous and Metamorphic Petrology Lab *(4; 4.7)*
S2020 ERTH380 Igneous and Metamorphic Petrology *(8; 4.5)*
S2020 ERTH380 Igneous and Metamorphic Petrology Lab *(8; 4.3)*

Sonoma State University *(number of students; rating out of 5)*
F2019 Advanced Principles of Geology *(18; 4.6)*
F2019 Our Dynamic Earth: Introduction to Geology *(15; 4.5)*
F2018 Mineralogy *(15; 4.5)*
F2018 Our Dynamic Earth: Introduction to Geology *(44; 4.8)*
S2018 Igneous and Metamorphic Petrology Field *(17; 5)*
S2018 Igneous and Metamorphic Petrology *(17; 5)*
F2017 Mineralogy *(20; 5)*
F2017 Our Dynamic Earth: Introduction to Geology *(46; 4.4)*

Keck Frontiers Research Program
Su2017 Research Program *(16; 4.9)*

Service and Outreach

Committees

2021-present EES Program Reviewer for Earth Science BS and G3 graduate studies
2021-present Department Assessment Task Force (HED reporting for NMT)
2020-present Curriculum Committee Member
2020-present Space Committee Member

2020-present	Undergraduate/Recruitment Committee Member
2023	Primary data compiler and primary author of the EES Department Review
2020	Ad hoc PhD Entrance Exam Committee

Invited Lectures

2025	University of Maryland, College Park, MD
2024	Los Alamos National Laboratory, Los Alamos, NM
2021	New Mexico State University, Las Cruces, NM
2020	Dalhousie University, Halifax, Nova Scotia, CA (MSA Lecture Series)
2020	North Carolina State University, Raleigh, NC
2020	University of Toronto, Toronto, Ontario, CA (MSA Lecture Series)
2020	Brigham Young University, Provo, UT (MSA Lecture Series)
2020	Idaho State University, Pocatello, ID (MSA Lecture Series)
2020	University of Nevada, Reno, NV (MSA Lecture Series)
2019	San Jose State University, San Jose, CA (MSA Lecture Series)
2019	Florida State University, Tallahassee, FL (MSA Lecture Series)
2019	College of William and Mary, Williamsburg, VA (MSA Lecture Series)
2019	University of California, Berkeley, CA
2018	Chico State University, Chico, CA
2017	Harvard University, Boston, MA
2017	University of Southern California, Los Angeles, CA

Outreach

2021-present	Mentoring and Teaching Creates Hope (MATCH) STEM Reading // Experiment Program for Third Grade
2020	STEM bits Albuquerque Radio Programming (two segments on Valles Caldera work)
2018	Piner High School Visit to SSU campus- Sandbox Tour
2017	Piner High School STEM event
2017	Fall Newsletter Item
2017	Program Director for Kech Geology Consortium: Dominica