

**Matthew J. Zimmerer**

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**EDUCATION:**

New Mexico Institute of Mining and Technology

PhD in Geochemistry (with focus in Volcanology/ Geochronology) September 2011  
Dissertation: The volcanic-plutonic relationship at three contrasting Rio-Grande-rift  
faulted calderas

MS in Geochemistry (with focus in Volcanology/ Geochronology) August 2008

University of Kentucky

BS in Geology; May 2005

**WORK EXPERIENCE:**

New Mexico Bureau of Geology Field Geologist II May 2015 – present  
New Mexico Tech Adjunct Professor March 2014 – present  
New Mexico Tech Geology Field Camp Instructor May 2013 – present  
Antarctica Researcher/Field Assistant at Mt. Erebus Volcano Observatory  
Austral summers 2007/2008, 2008/2009, 2010/2011, 2016/2017, and 2018/2019  
New Mexico Bureau of Geology Postdoctoral Researcher September 2011 – May 2015  
Freelance Photographer/Educational Content Developer for Pearson Publishing  
July 2014 – November 2015  
New Mexico Geochronology Research Laboratory Assistant May 2006 – September 2011  
New Mexico Tech Teaching Assistant August 2005 – May 2011  
Center for Applied Energy Resources May 2004-June 2005

**GRANTS AND AWARDS:**

NSF-OPP-1745015. Collaborative Research: Constraining West Antarctic Ice Sheet Elevation  
during the last interglacial (\$122,022 – Continuing grant, year 1 of 3: Lead PI from NMT)  
8/2018 - current  
NSF-EAR-1322089. Volcanic hazard assessment in the southwestern US based on high-  
precision Ar/Ar geochronology of late Quaternary eruptive centers (\$197,771; first-time  
Principal Investigator) 7/2013 – 6/2016  
NSF-EAR-1050188. Collaborative Research: Caldera magmatism for the inside out: A  
geochronologic and geochemical investigation of plutonic and volcanic rocks in three  
contrasting calderas (\$111,421; Co-wrote with PI McIntosh) 3/2011 – 2/2014  
Robert Wellnitz Memorial Scholarship Fall 2010  
New Mexico Geological Society Fall Field Conference scholarship Fall 2010, 2008, 2005  
New Mexico Geological Society Undergraduate Mentor Scholarship Spring 2009  
Frank Kottowski Research Grant Spring 2009  
New Mexico Geological Society Grant in aid Spring 2008, 2006  
Richard A. Matuszcki Research Grant Spring 2007  
Pirtle Award to outstanding undergraduate with senior status Spring 2004

## **MEMBERSHIPS:**

New Mexico Geological Society  
Geological Society of America

2005-present  
2003-present

## **CERTIFICATIONS**

FAA Remote Pilot  
Wilderness First-Aider

October 2016 – present  
February 2016 - 2019

## **PUBLICATIONS IN REFERRED JOURNALS (in reverse chronologic order):**

Lukács, R., Harangi, S., Guillong, M., Bachmann, O., Folor, L., Buret, Y., Dunkl, I., Sliwinski, J., von Quadt, A., Peytcheva, I., and Zimmerer, M., 2018, Earth to Mid-Miocene syn-extensional massive silicic volcanism in the Pannonian Basin (East-Central Europe): Eruption chronology, correlation potential and geodynamic implications: *Earth-Science Review*, v. 179, p. 1-19.

Koning, D.J., Aby, S., Grauch, V.J.S., and Zimmerer, M.J., 2016, Latest Miocene-earliest Pliocene evolution of the ancestral Rio Grande at the Espanola-San Luis Basin boundary, northern New Mexico, v. 38, no. 2, p. 24-49.

Coleman, D.S., Mills, R.D., and Zimmerer, M.J., 2016, The Pace of Plutonism: *Elements*, v. 12, p. 87-102.

Zimmerer, M.J., Lafferty, J., and Coble, M.A., 2016. The eruptive and magmatic history of the youngest pulse of volcanism at the Valles caldera: Implications for successfully dating late Quaternary eruptions: *Journal of Volcanology and Geothermal Research*, v. 310, p. 50-57.

Channer, M.A., Ricketts, J.W., Zimmerer, M., Heizler, M., and Karlstrom, K.E., 2015, Surface uplift above the Jemez mantle anomaly in the past 4 Ma based on  $^{40}\text{Ar}/^{39}\text{Ar}$  dated paleoprofiles of the Rio San Jose, New Mexico, USA: *Geosphere*, v. 11, no. 5, p. 1384-1400.

Lipman, P.W., Zimmerer, M.J., and McIntosh, W.C., 2015, An ignimbrite caldera from the bottom up: Exhumed floor and fill of the resurgent Bonanza caldera, Southern Rocky Mountain volcanic field, Colorado: *Geosphere*, v. 11, p. 1902-1947.

Zimmerer, M.J., and McIntosh, W.C., 2013, Geochronologic evidence of upper-crustal in situ differentiation: silicic magmatism at the Organ caldera complex: *Geosphere*, v. 9, p. 155-169.

Zimmerer, M.J., and McIntosh, W.C., 2012, An investigation of caldera-forming magma chambers using the timing of ignimbrite eruptions and pluton emplacement at the Mt. Aetna caldera complex: *Journal of Volcanology and Geothermal Research*, v. 245-246, p. 128-148.

Zimmerer, M.J., and McIntosh, W.C., 2012, The geochronology of volcanic and plutonic rocks at the Questa caldera: Constraints on the origin of caldera-related silicic magmas: Geological Society of American Bulletin, v. 124, p. 1394-1408.

Hower, J.C., Mastalerz, M., Drobniak, A., Quick, J., Eble, C.F., and Zimmerer, M.J., 2005, Mercury content of the Springfield coal, Indiana and Kentucky: International Journal of Coal Geology, v. 63, p. 205-277.

**PUBLICATIONS IN NON-REFERRED JOURNALS and BOOKS  
(in reverse chronologic order):**

Dunbar, N., Lucas, S., Zimmerer, M., and Jochems, A., 2019, Organ Mountains-Desert Peaks and Prehistoric Trackways National Monuments: Lite Geology, v. 44, p. 3-5

Zimmerer, M., 2018, Drones for the Geosciences: A New Eye in the Sky: New Mexico Earth Matters, v. 18, no. 1, p. 1-5.

Zimmerer, M., 2018, Rio Grande del Norte National Monument: Where volcanoes and rivers collide!: Lite Geology, v. 43, p. 6-7.

Lipman, P.W., Zimmerer, M.J., and McIntosh, W.C., 2017, IAVCEI RGR-SRMVF Day 6: Bonanza Caldera *in* Continental arc to rift volcanism of the Southern Rocky Mountains – Southern Rocky Mountain, Taos Plateau and Jemez volcanic fields of southern Colorado and northern New Mexico, USA: IAVCEI 2017 Pre-meeting Field Trip.

Lueth, V., Heizler, L., Zimmerer, M., and McNamara, K., 2017, Geo-ski-ology: A photo Gallery: Lite Geology, v. 41, p. 6-11.

Zimmerer, M.J., Gonzales, D.A., and Karlstrom, K.E., 2017, Day 2 road log from Ouray to South of Animas Forks via Silverton: Geology along the million dollar highway and of the western San Juan Calderas *in The Geology of the Ouray-Silverton Area* eds. Karlstrom, K.E., Gonzales, D.A., Zimmerer, M.J., Heizler, M., and Ulmer-Scholle, D.S.: New Mexico Geological Society 68<sup>th</sup> Annual Fall Field Conference 219 p.

Zimmerer, M.J., 2017, Cold Geology: Lite Geology, v. 41, p. 2-4.

Welch, S., McNamara, K., and Zimmerer, M., 2016, Class Room Activity: Exploring Intrusive Dikes Using a Gelatin Model: Lite Geology, v. 40, p. 15.

Zimmerer, M.J., 2016, Igneous Dikes of New Mexico: Lite Geology, v. 40, p. 3-4.

Zimmerer, M.J., 2016, Mud-amorphosis: The metamorphic journey of mud: Lite Geology, v. 39, p. 4.

Zimmerer, M.J., 2015, The volcano-dating game: Lite Geology, v. 38, p. 3.

Lipman, P.W., McIntosh, W.C., and Zimmerer, M.J., 2013, From ignimbrite to batholith, northeastern San Juan Mountains, Colorado: Bonanza, Cochetopa Park, and North Pass calderas: The Geological Society of America Field Guide, v. 33, p. 1-32.

Garcia, L., Petronis, M., Koning, D., Zimmerer, M., Dunbar, N., 2011, Structural, anisotropy of magnetic susceptibility, geochemistry, and paleomagnetic investigations of a steeply dipping, welded tuff (Amalia Tuff) south of Peteca, New Mexico: New Mexico Geological Society Guidebook, v. 62, p. 105-109.

Zimmerer, M.J., and McIntosh, W.C., 2011,  $^{40}\text{Ar}/^{39}\text{Ar}$  dating, sanidine chemistry, and potential sources of the Las Tablas tuff, northern New Mexico: New Mexico Geological Society Guidebook, v. 62, p. 215-222.

McIntosh, W.C., Koning, D.J., and Zimmerer, M.J., 2011, Irregular bodies of non-welded Amalia Tuff with the Pena Tank rhyolite, western San Luis Basin, north-central NM: New Mexico Geological Society Guidebook, v. 62, p. 223-234.

Wilcock, J., Longpre, M., de Moor, M., Ross, J., and Zimmerer, M., 2010, Calderas bottom-to-top: an online seminar and field trip: Eos (Transaction, American Geophysical Union), v. 91, p. 1-2.

McLemore, V.T, and Zimmerer, M.J., 2009, Magmatic activity and mineralization along the Capitan, Santa Rita, and Morenci Lineaments in the Chupadera Mesa area, central New Mexico: New Mexico Geological Society Guidebook, v. 60, p 375-386.

**ABSTRACTS PRESENTED AT MEETINGS (in reverse chronologic order):**

Graff, T.G., Evans, C.A., Bleacher, J.E., Young, K.E., Helper, M.A., Tewksbury, B.J., Hurtado Jr., J.M., Edgar, L.A., Thompson, R.A., Stefanov, W.L., Osinski, G.R., Regberg, A.B., Zeigler, R.A., Bauer, P.W., Wilkinson, M.J., Zimmerer, M.J., Timmons, M., and Read, A., 2019, Earth and planetary science training for Nasa's newest astronauts: 2018 Training and 2019 Planning: 50<sup>th</sup> Lunar and Planetary Science Conference 2019, PLI Contrib. No. 2132.

Cadol, D., Newton, T., Duval, B., and Zimmerer, M., 2018, Effects of wildfire, regrowth, and Diorhabda defoliation of tamarisk on riverine forest evapotranspiration. Poster presentation at WRRI.

Cadol, D.D., Duval, B., Newton, B.T., Stark, K., and Zimmerer, M.J., 2018, Interactions among wildfire, water table elevation, and Diorhabda, (Tamarisk Beetle) Influence Riverine Forest Regrowth and Evapotranspiration Recovery: American Geophysical Union, H21F-08.

Evans, C.A., plus 17 co-authors including Zimmerer, 2018, Field camp for Astronauts: NASA's geoscience training program for planetary exploration: American Geophysical Union, 31H-3798.

- Zimmerer, M.J., and Ramos, F.C., 2018, Insights into postcaldera magmatism and related hazards using volcanic and plutonic records: NMGS Annual Spring Meeting Program with abstracts, p. 83.
- Zimmerer, M.J., and Ross, J.I., 2018, Using drones to understand fluvial systems: Lessons learned from a year of flying along the Rio Grande: Geological Society of America Abstracts with Programs. Vol. 50, No. 6, p. 155-5.
- Heizler, M.T., Karlstrom, K., Zimmerer, M., Ross, J., Crossey, L., and McIntosh, W., 2017, Detrital Sanidine  $^{40}\text{Ar}/^{39}\text{Ar}$  Dating, Transforming Sedimentary Rock Geochronology: NMGS Spring Meeting Abstracts, p. 35.
- Lipman, P., and Zimmerer, M., 2017, Magmato-Tectonic Links: Ignimbrite Calderas, Regional Dike Swarms, and the Transition from Arc to Rift in the Southern Rocky Mountains: IAVCEI 2017 Scientific Assembly, Submission 76.
- Pinkerton, S., Ramos, F.C., and Zimmerer, M., 2017, The Raton-Clayton Volcanic Field: Evaluating Open-System processes in Magmas Derived Beneath the Great Plains: NMGS Spring Meeting Abstracts, p. 58.
- Sliwinski, J., Bachmann, O., Guillong, M., Zimmerer, M., and Lipman, P., 2017, Geochemical and geochronological comparison of cogenetic crystal-rich dacites and crystal-poor rhyolites in the Southern Rocky Mountain Volcanic Field, CO: IAVCEI 2017 Scientific Assembly, Submission 772.
- Zimmerer, M., Heizler, M., and McIntosh, 2017, An age-based assessment of volcanic hazards within the Rio Grande rift and along the Jemez Lineament, New Mexico, U.S.A: IAVCEI 2017 Scientific Assembly, Submission 1220.
- Zimmerer, M.J., and Ross, J.I., 2017, Turning Toys into Tools: Unmanned Aircrafts for the 21<sup>st</sup> Century Geoscientist: NMGS Spring Meeting Abstracts, p. 77.
- Chan, C.F., Thompson, R.A., Zimmerer, M.J., Premo, W.R., and Sroba, R.R., 2016, Insight into small-volume volcanic fields in central Rio Grande rift-Albuquerque Volcanoes, New Mexico: Geological Society of America Abstracts with Programs, v. 48, no. 7, paper no. 173-4.
- Johnson, S.P., Geissman, J.W., Zimmerer, M.J., and Lipman, P.W., 2016, Evaluation of magma flow and emplacement mechanisms of the mafic Ducle-Platoro dike swarm, NW New Mexico and SW Colorado using magnetic susceptibility fabrics: Geological Society of America Abstracts with Programs, v. 48, no. 7, paper no. 347-26.
- Lipman, P.W., and Zimmerer, M.J., 2016, Magmato-tectonic links: Ignimbrite calderas, regional dike swarms, and the transition from arc to rift in the southern Rocky Mountains

(invited presentation): Geological Society of America Abstracts with Programs, v. 48, no. 7, paper no. 54-9.

Zimmerer, M., Lafferty, J., and Ramos, F., 2016, Volcanic hazards at the southwest's supervolcano: Ongoing efforts to temporally dissect the eruptive and magmatic history of the Valles caldera: New Mexico Geological Society Spring Meeting.

Lafferty, J.N., and Zimmerer, M.J., 2015, U/Th and  $^{40}\text{Ar}/^{39}\text{Ar}$  dating provides eruptions ages and magmatic evolution for the East Fork Member of the Valles Rhyolite: 2015 New Mexico Geological Society Annual Spring Meeting, p. 30.

Sliwinski, J., Zimmerer, M., Guillong, M., Bachmann, O., and Lipman, P., 2015, Zircon U-Pb age distributions in cogenetic crystal-rich dacitic and crystal-poor rhyolitic members of zoned ignimbrites in the Southern Rocky Mountains by chemical abrasion inductively-coupled-plasma mass spectrometry (CA-LA-ICP-MS): 2015 AGU Fall Meeting, V51G-3114.

Zimmerer, M.J., 2015, Vent migration patterns of late Quaternary basaltic volcanism within the Rio Grande rift and along the Jemez Lineament: 2015 New Mexico Geological Society Annual Spring Meeting, p. 68.

Zimmerer, M.J., McIntosh, W.C., Heizler, M.T., and Lafferty, J., 2014, Using high-precision  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronology to understand volcanic hazards within the Rio Grande rift and along the Jemez Lineament, NM: Eos Transactions, American Geophysical Union, V51A-4729.

Zimmerer, M.J., McIntosh, W.C., Heizler, M.T., Dunbar, N.W., and Lafferty, J., 2014, A high-precision  $^{40}\text{Ar}/^{39}\text{Ar}$  chronology of volcanism in the Raton-Clayton volcanic field: New Mexico Geological Society Spring Meeting with abstracts.

Zimmerer, M.J., and McIntosh, W.C., 2012, Tracking the waning stages of caldera magmatism using exposed subcaldera plutons: Eos Transactions, American Geophysical Union, V31C-2809.

Zimmerer, M.J., and McIntosh, W.C. 2012, Postcaldera magmatism at three Rio-Grande- rifted calderas: Implications for assessing volcanic hazards at active caldera systems in the USA: Volcanism in the American Southwest USGS Meeting, 34p.

Lipman, P.W., McIntosh, W.C., and Zimmerer, M.J., 2012, Bonanza, an "extreme" resurgent ignimbrite caldera cycle in the San Juan Mountains, Colorado: Eos Transactions, American Geophysical Union, V31B-2772.

Zimmerer, M.J., and McIntosh, W.C., 2011, There's more than one way to build a caldera magma chamber: Evidence from volcanic-plutonic relationships at three faulted Rio-Grande-rift calderas: Eos (Transactions, American Geophysical Union).

- Zimmerer, M.J., and McIntosh, W.C., 2011, The eruptive history and evidence for protracted pluton emplacement associated with the Organ Caldera, south-central New Mexico: *New Mexico Geology*, v. 33, p. 50-51.
- Lipman, P.W., McIntosh, W.C., and Zimmerer, M.J., 2010, Brief lifespans and rapid recurrence of large ignimbrite-caldera cycles (super-eruptions) in the mid-Tertiary Southern Rocky Mountain volcanic field, Colorado-New Mexico: *Eos Transactions, American Geophysical Union*, V24A-04.
- Zimmerer, M.J., Mills, R.D., Coleman, D.S., McIntosh, W.C., and Hughes, S., 2010, Using the intrusive record to understand caldera magmatism: the geochronology and geochemistry of the Mt. Aetna caldera complex, central Colorado: *Abstracts with Programs Geological Society of America*, v. 42, p. 655.
- Mills, R.D., Zimmerer, M.J., Coleman, D.S., McIntosh, W., Samperton, K.M., and Tynpel, J.F., 2010, High-precision geochronology of ignimbrites and associated plutons of two caldera systems in central Colorado and northern New Mexico: *Geological Society of America Abstracts with Programs*, v. 42, pp. 618.
- Tappa, M.J., Coleman, D.S., and Zimmerer, M.J., 2009, Testing competing caldera models using U/Pb geochronology and trace-element modeling in the Questa caldera, New Mexico: *Eos Transactions, American Geophysical Union*, v. 90, n. 52.
- Zimmerer, M.J., McLemore, V.T., and McIntosh, W.C., 2009, Ages of plutons in southwestern New Mexico and their relationship to caldera formation and mineralization: *New Mexico Geology*, v. 31, p. 43.
- Zimmerer, M.J., and McIntosh, W.C., 2009, An  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronology and thermochronology study of caldera volcanism and related plutonic processes, Questa caldera, northern New Mexico: *New Mexico Geology*, v. 31, p. 49.
- McLemore, V.T., Zimmerer, M.J., McIntosh, W.C., and Heizler, M.T., 2009, Laramide volcanism, plutonism, and porphyry copper deposits in southwestern New Mexico: *New Mexico Geology*, v. 31, pp. 42.
- Wilch, T.I., McIntosh, W.C., Panter, K.S., Dunbar, N.W., Smellie, J.L., Fargo, A., Scanlan, M., Zimmerer, M.J., Ross, J., and Bosket, M.E., 2008, Volcanic and glacial geology of the Miocene Minna Bluff volcanic complex, Antarctica: *Eos (Transactions, American Geophysical Union)*, v. 89, p. 1-2.
- Zimmerer, M.J., McIntosh, W.C., and Dunbar, N.W., 2007, The  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronology and thermochronology of the Latir volcanic field, New Mexico: implications for silicic caldera volcanism: *New Mexico Geology*, v. 29, p. 57.

Hower, J.C., Mastalerz, M., Drobnik, A., Zimmerer, M.J., Eble, C.F., 2004, The environmental impact of trace element contents of western Kentucky and Indiana coals: Geological Society of America Abstracts with Programs, v. 36, pp. 215.