

CHAD D. DEERING

Dept. of Geological and Mining Engr. & Sciences
Michigan Technological University
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EDUCATION

University of Canterbury, Christchurch, New Zealand

2009 Ph.D. in Geological Sciences, Igneous Petrology, Geochemistry, Volcanology

Michigan State University, East Lansing, Michigan

2005 M.S. in Geological Sciences, Igneous Petrology and Geochemistry

2003 B.S. in Geological Sciences (with Honors)

TEACHING EXPERIENCES

- 2020- Associate Professor, Geological & Mining Engineering & Sciences, Michigan Technological University
- 2014-2020 Assistant Professor, Geological & Mining Engineering & Sciences, Michigan Technological University
Courses: Introduction to Petrology, Mineral Science, Geochemistry, Magma Reservoir Dynamics, Field Geology with Engineering Applications
- 2011-2013 Assistant Professor, Geology Department, University of Wisconsin-Oshkosh
Courses: Physical Geology, Lithology, Geochemistry, Energy and Mineral Resources, Field Course in Geology (Yellowstone National Park)
- 2009 Asst. Lecturer, Department of Geological Sciences, University of Canterbury
Courses: *Igneous and Metamorphic Petrology, Physical Volcanology, Geochemistry*
- 2007-2008 Teaching assistant, Department of Geological Sciences, University of Canterbury
Courses: *Earth Materials and Earth Dynamics, Plate Tectonics*
- 2002-2005 Teaching assistant, Department of Geological Sciences, Michigan State University
Courses: *Geology in the Human Environment, Mineralogy and Geochemistry, Structural Geology*

GRADUATE STUDENT RESEARCH ADVISING

- Present Supervisor to Jacob Bonessi, Brandi Petryk, Quelyn Bekkering, and Anna del Fratte (MSc); Olivia Barbee and Rachel Hetherington (PhD); co-supervisor to David Kelly, Thomas Bodden, Daniel Trekas, Adren Rigdon, and Colin Tyrrell at GMES Michigan Technological University
- 2015-2018 Supervisor to Christie Torres (MSc) at GMES Michigan Tech University
- 2014-2016 Supervisor to Taya Flaherty (MSc) at GMES Michigan Tech University
- 2014-2016 Supervisor to Jordan Lubbers (MSc) at GMES Michigan Tech University
- 2013-2018 Co-supervisor to Tom Garden (PhD) at the Geological Sciences Department, University of Canterbury, New Zealand
- 2014-2015 Supervisor to Peipei Lin and Aurelia Liegler (MSc), at GMES Michigan Tech University
- 2014-2015 Co-supervisor to Carlo Prandi and Nicola Mari (MSc) at GMES Michigan Tech University
- 2011-2014 Co-supervisor to Florence Bégué (PhD) at the Geological Sciences Department, University of Canterbury, New Zealand
- 2011-2013 Co-supervisor to Susan Krans (MSc) at the Department of Geology, Bowling Green State University
- 2009-2011 Co-supervisor to Eva Hartung (MSc) at the Geological Sciences Department, University of Canterbury, New Zealand

RESEARCH EXPERIENCE

- 2009-2011 Research Associate, Earth and Space Sciences, University of Washington
- 2006-2009 Doctoral research: *Spatial and Temporal Distribution of a Rhyolite Compositional Continuum from Wet-oxidizing to Dry-reducing Types Governed by Lower-Middle Crustal P-T-fO₂-fH₂O Conditions in the Taupo Volcanic Zone, New Zealand*
Advisors: Jim Cole, Steve Weaver, Colin Wilson, Ian Nairn
University of Canterbury, New Zealand, Department of Geological Sciences
- 2003-2005 Masters research: *Petrogenesis of Distinct Silicic Magma Types from the Lower Pleistocene Guachipelin Caldera, NW Costa Rica: Extensive Magma Mixing and Protracted Subvolcanic Residence*
Advisors: Lina Patino, Tom Vogel, Bill Cambray, David Hindle
Michigan State University, Department of Geological Sciences

OTHER ACTIVITIES

- 2003-2005 Laboratory manager, Department of Geological Sciences, Michigan State University
- 2002 Laboratory technician, Department of Geological Sciences, Michigan State University

HONORS, AWARDS, SCHOLARSHIPS

- 2018 Michigan Technological University, Deans' Teaching Showcase
- 2011 **(declined offer)** USGS Mendenhall Postdoctoral Fellowship:
Investigating the magmatic evolution of the Cortez dike complex and Caetano volcanic-plutonic systems and the origin of spatially-temporally associated gold mineralization, Central Nevada
- 2006-9 University of Canterbury Doctoral Scholarship
- 2003 Michigan State University. John T. Wilband Memorial Scholarship: Recognition of academic excellence
- 2003 Michigan State University. Estwing Award: Recognition of outstanding contributions to the department

PROFESSIONAL SOCIETIES

- American Geophysical Union
- Geological Society of America
- Mineralogical Society of America

Executive Editor: Geological Magazine (*Cambridge Journals*)

Jan. 2016 to 2020

Editorial Board: Minerals

Sept. 2024 to present

FUNDING

- 2020-2023 NASA (\$116,624): Volcanic aerosol impacts on satellite trace gas retrievals: Enabling volcanic emission plume composition measurements to track evolving sub-surface magmatic conditions
PI: Stephen Broccardo; co-PI Chad Deering: \$116,000
- 2019-2020 USGS Keweenaw Fault Geometry Related Structures and Slip Kinematics along the Lac La Belle-Mohawk Segment Michigan: \$35,000
PI: Jim DeGraff, Co-PIs: Chad Deering and Aleksey Smirnov
- 2018-2019 NASA (WBS 281945.02.47.04.43) Understanding basaltic volcanic processes by remotely measuring the links between vegetation health and extent, and volcanic gas and thermal emissions using HypIRI-like VSWIR and TIR data: \$49,979
PI: Chad Deering
- 2018-2019 Michigan Space Grant Consortium: The Origin of an Archean Batholith – Michigan’s Upper Peninsula: \$5,000
PI: Brandi Petryk (graduate student); Chad Deering (supervisor)
- 2017-2020 NSF-EAR GeoPRISMS (Award#1654506) Collaborative research: Assessing changes in the state of a magma storage system over caldera-forming eruption cycles, a case study at Taupo Volcanic Zone, New Zealand: \$388,261
PI: Chad Deering, Kari Cooper and Adam Kent
- 2015-2018 NASA (14-HYSP14-0013): Understanding basaltic volcanic processes by remotely measuring the links between vegetation health and extent, and volcanic gas and thermal emissions using HypIRI-like VSWIR and TIR data; Michigan Tech GMES: \$212,448 and Michigan Tech Research Institute: \$135,409
PI: Chad Deering
- 2014-17 NSF-EAR-RUI funded (Award#: 1249821): \$83,622 to Michigan Tech, \$28,530 to Bowdoin College
Collaborative Research: Probing Caldera-forming Magmatism: Crystal Accumulation in Large, Upper Crustal Silicic Magma Chambers
PI: Chad Deering, Co-PI: Rachel Beane
- 2014 Michigan Tech University REF-SEED: Quantification of Diffuse CO₂ Flux From Magma Degassing at Yellowstone Caldera: \$25,000
PI: Chad Deering
- 2013 Student Technology Fund, University of Wisconsin-Oshkosh: \$19,291; 28 iPads (+microscope cameras), Tablet Charging Cart
Digital, Inquiry-Based Proficiency in Earth Science Classes: Integration of iPads into Laboratory Experiences
PI: Chad Deering

- 2013 Faculty Small Grant Proposal; Faculty Development: \$750
- 2013 Student-Faculty Collaborative Research Grant, University of Wisconsin-Oshkosh: \$3,825.00
Conditions of Mineral Deposition Related to Super-Eruptions
 PI: Jordan Lubbers (undergraduate student); Chad Deering (supervisor)
- 2012 Gateway Success Initiative Grant, University of Wisconsin-Oshkosh; \$3,000
Building Peer Evaluation and Shared Learning Pedagogies into Gateway Geology Laboratory Exercises
 PIs: Chad Deering, Eric Hiatt, Christie Demosthenous
- 2011 NSF Co-funded (Award#: 1141997); SEES, PIRE, EAR: \$68,923
Joint United States-New Zealand Geothermal Research Workshop
 PI: Chad Deering; co-PI: Olivier Bachmann
- 2010-15 Mighty River Power, New Zealand: ~\$1.8 million
From Source to Surface: Improving drilling target success and identification of blind geothermal resources via volatile systematics.
 PIs Darren Gravley, Chad Deering, Clinton Rissman, Ben Kennedy
- 2009-10 University of Washington, Royalty Research Fund: \$39,064
The importance of volatile elements during and after large explosive volcanic eruptions.
 PIs: Olivier Bachmann and Chad Deering
- 2006-8 Mason Trust Fund: University of Canterbury, Department of Geological Sciences: \$5,950
Magma plumbing beneath the Okataina Volcanic Complex, Taupo Volcanic Zone, New Zealand

REFEREED JOURNAL ARTICLES

***Denotes supervised or co-supervised student.**

Total citations: 3255

H-index: 32

10-index: 48

1. Schlieder, T. D., Cooper, K. M., Kent, A. J., Gravley, D., **Deering, C.**, Rubin, S., & Johnson, A. (2025). Insights into the construction of the Oruanui magma reservoir from a comparison of zircon hosted in plagioclase and whole-rock. **Earth and Planetary Science Letters**, 666, 119495.
2. Prakash, K. J., Sajinkumar, K. S., **Deering, C. D.**, & Oommen, T. (2025). New Estimate on the Spatial Distribution of the Youngest Toba Tuff Ash. **Terra Nova**, 37(3), 141-147.
3. Teixeira, L. F., Laurent, O., Troch, J., Siddoway, C. S., Tavazzani, L., **Deering, C.**, & Bachmann, O. (2024). Tracking quartz and zircon provenance in sedimentary rocks using Ti distributions: Unlocking the volcanic-plutonic connection in old igneous systems. **Earth and Planetary Science Letters**, 643, 118906.
4. Nelson, K., Jiménez, C., **Deering, C.**, de Moor, M., Blackstock, J., Broccardo, S., Schwandner, F., Fisher, J., Chatterjee, S., Alvarado Induni, G., Rodriguez, A., Guillén Pachacama, D., Berne, A., Prada Cordero, C., Rivera Gonzalez, P., Essig, E., Anderson, M., Hernandez, C. (2024) Total CO₂ budget estimate and degassing dynamics for an active stratovolcano: Turrialba Volcano, Costa Rica. **Journal of Volcanology and Geothermal Research**, 450, 108075.
5. Teixeira, L., Laurent, O., Troch, J., Siddoway, C., Tavazzani, L., **Deering, C.**, Bachmann, O. (2024) Tracking quartz and zircon provenance in sedimentary rocks using Ti distributions: Unlocking the volcanic-plutonic connection in old igneous systems. **Earth and Planetary Science Letters**, 643, 118906.
6. Paulsen, T., Encarnacion, J., Grunow, A., Benowitz, J., Layer, P., **Deering, C.**, Sliwiniski, J. (2023) Outboard onset of Ross orogen magmatism and subsequent igneous and metamorphic cooling linked to slab rollback during late-stage Gondwana assembly. **Geosciences**, 13(4), 126.
7. Bodden, T., Bornhorst, T., Begue, F., **Deering, C.** (2022) Sources of hydrothermal fluids inferred from oxygen and carbon isotope composition of calcite, Keweenaw Peninsula Native Copper District, Michigan, USA. **Minerals**, 12(4), 474.
8. Cornet, J., Bachmann, O., Ganne, J., Fiedrich, A., Huber, C., **Deering, C.**, Feng, X. (2022) Assessing the effect of melt extraction from mushy reservoirs on compositions of granitoids: From a global database to a single batholith. **Geosphere**, 18(3) 985-999.

9. Sliwinski, J., Guillong, M., Lipman, P., Zimmerer, M., **Deering, C.**, Bachmann, O. (2022) Zircon U-Pb geochronology and trace element dataset from the Southern Rocky Mountain volcanic field, Colorado, USA. **Data in brief**, 43, 108362.
10. Pamukcu, A., Schoene, B., **Deering, C.**, Keller, B., Eddy, M. (2022) Volcano-pluton connections at the Lake City magmatic center (Colorado, USA). **Geosphere**, 18(5), 1435-1452.
11. Paulsen, T., **Deering, C.**, Sliwinski, J., Chatterjee, S., Bachmann, O. (2022) Continental magmatism and uplift as the primary driver for first-order oceanic $^{87}\text{Sr}/^{86}\text{Sr}$ variability with implications for global climate and atmospheric oxygenation. **GSA Today**, 32(2), 4-10.
12. Svoboda, C., Rooney, T.O., Girard, G., **Deering, C.** (2022) Transcrustal magmatic systems: Evidence from Andesites of the Southern Taupo Volcanic Zone. **Journal of the Geological Society**, 179 (1).
13. Wang, X., **Deering, C.D.**, Liu, Zhenghong, L., Bachmann, O., Guillong, M. (2021) Provenance and tectonic implications of the Carboniferous sediments in the Bainaimiao arc belt, northern margin of the North China Craton: evidence from detrital zircon U-Pb-Hf isotopes and trace elements. **International Journal of Earth Sciences**, 110(1), 331-351.
14. T Paulsen, **C Deering**, J Sliwinski, S Chatterjee, O Bachmann, M Guillong (2020) Crustal thickness, rift-drift and potential links to key global events. **Terra Nova**
15. TO Garden, I Chambefort, DM Gravley, **CD Deering**, BM Kennedy (2020) Reconstruction of the fossil hydrothermal system at Lake City caldera, Colorado, USA: Constraints for caldera-hosted geothermal systems. **Journal of Volcanology and Geothermal Research**, 393, 106794.
16. Xingan Wang, **Chad Deering**, Zhenghong Liu, Xiaojie Dong, Shichao Li, Zhongyuan Xu (2020) Petrogenesis and tectonic regime of two types of Neoarchean amphibolites in the northern margin of the North China Craton. **International Geology Review**, 1-24.
17. Lubbers, J.*, **Deering, C.**, Bachmann, O. (2020) Genesis of rhyolitic melts in the upper crust: fractionation and remobilization of an intermediate cumulate at Lake City caldera, Colorado, USA. **Journal of Volcanology and Geothermal Research**. 392, 106750.
18. Barbee, O.*, Chesner, C., **Deering, C.** (2020) Quartz in Toba rhyolites show textures symptomatic of rapid crystallization. **American Mineralogist**
19. Chatterjee, S., **Deering C.**, Waite, G.P., Prandi, C.*, Lin, P.* (2019) An adaptive sampling strategy developed for studies of diffuse volcanic soil gas emissions. **Journal of Volcanology and Geothermal Research**, 381, 246-261.

20. Gualda, G., Gravley, D.M., **Deering, C.D.**, Ghiorso, M.S. (2019) Magma extraction pressures and the architecture of volcanic plumbing systems. ***Earth and Planetary Science Letters***, 522, 118-124.
21. P. Lin*, **C.D Deering**, C. Werner, C. Torres (2019). Origin and quantification of diffuse CO₂ and H₂S emissions at Crater Hills, Yellowstone National Park. ***Journal of Volcanology and Geothermal Research***, 377, 117-130.
22. Guilherme A. R. Gualda, Darren M. Gravley, Michelle Connor, Brooke Hollmann, Ayla S. Pamukcu, Florence Bégué, Mark S. Ghiorso, **Chad D. Deering** (2018). Climbing the crustal ladder: Magma storage-depth evolution during a volcanic flare-up. ***Science Advances***, 4, no. 10, eaap7567.
23. Panter, K., Castillo, P., *Krans, S., **Deering, C.**, McIntosh, W., Valley, J., Kitajima, K., Kyle, P., Hart, S., Blusztajn, J. (2018). Melt origin across a rifted continental margin: a case for subduction-related metasomatic agents in the lithospheric source of alkaline basalt, northwest Ross Sea, Antarctica. ***Journal of Petrology***, 59, 3, 517-558.
24. Shan-Shan Li, S. Keerthy, M. Santosh, S.P. Singh, **C. Deering**, M. Satyanarayanan, M.N. Praveen, V. Aneeshkumar, G.K. Indu, K.S., Sajinkumar (2018). Anatomy of impactites and shocked zircon grains from Dhala reveals Paleoproterozoic meteorite impact in the Archean basement rocks of Central India. ***Gondwana Research***, 54, 81-101.
25. Paulsen, T., **Deering, C.D.**, Sliwinski, J., Bachmann, O. (2017). Evidence for a spike in mantle carbon outgassing during the Ediacaran period. ***Nature Geoscience***, 10, 930-934.
26. Kari M. Cooper, Christy B. Till, Adam J. R. Kent, Fidel Costa, Allison E. Rubin, Darren Gravley, **Chad Deering**, Jim Cole, Maitrayee Bose (2017). Response to Comment on “Rapid cooling and cold storage in a silicic magma reservoir recorded in individual crystals”. ***Science***, 358, 6370, eaap9145.
27. *Allison E. Rubin, Kari M. Cooper, Christy B. Till, Adam J. R. Kent, Fidel Costa, Maitrayee Bose, Darren Gravley, **Chad Deering**, Jim Cole (2017). Rapid cooling and cold storage in a silicic magma reservoir. ***Science***, 356, 6343, 1154-1156.
28. *Fiedrich, A., Bachmann, O., Ulmer, P., **Deering, C.D.**, Kunze, K. (2017). Mineralogical and textural indicators of crystal accumulation in the Adamello Batholith (Northern Italy). ***American Mineralogist***, 102 (12), 2467-2483.
29. Timothy Paulsen, **Chad Deering**, Jakub Sliwinski, Victor Valencia, Olivier Bachmann, and Marcel Guillong (2017). Detrital zircon ages and trace element compositions of Permian– Triassic foreland basin strata of the Gondwanide orogen, Antarctica. ***Geosphere***, 13 (6), 2085-2093.
30. Timothy Paulsen, **Chad Deering**, Jakub Sliwinski, Olivier Bachmann, Marcel Guillong (2017). New detrital zircon age and trace element evidence for 1450 Ma igneous zircon sources in East Antarctica. ***Precambrian Research***, 300, 53-58.

31. *Garden, T.O., Gravley, D., Kennedy, B., **Deering, C.**, Chambefort, I. (2017). Controls on hydrothermal fluid flow in caldera-hosted settings: New insights from Lake City caldera, U.S.A. **Geosphere**, 13 (6), 1993-2016.
32. *Sliwinski, J.T., Bachmann, O., Dungan, M.A., Huber, C., **Deering, C.D.**, Lipman, P.W., Martin, L.H.J., Liebske, C. (2017). Rapid pre-eruptive thermal rejuvenation in a large silicic magma body: the case of the Masonic Park Tuff, Southern Rocky Mountain volcanic field, CO, USA. **Contributions to Mineralogy and Petrology**, 172: 30, <https://doi.org/10.1007/s00410-017-1351-3>.
33. Paulsen, T., **Deering, C.D.**, Sliwinski, J., Bachmann, O. (2017). New detrital zircon age and trace element evidence for 1450 Ma igneous zircon sources in East Antarctica. **Precambrian Research Note**, 300, 53-58.
34. Paulsen, T., **Deering, C.D.**, Sliwinski, J., Bachmann, O., Guillong, M., Valencia, V. (2017). Detrital zircon ages and trace element compositions of Permian-Triassic foreland basin strata of the Gondwanide orogeny, Antarctica. **Geosphere**, 13 (6), 2085-2093.
35. Florence Bégué, **Chad D. Deering**, Darren M. Gravley, Isabelle Chambefort. Ben M. Kennedy (2017). From source to surface: tracking magmatic boron and chlorine input into the geothermal systems of the Taupo Volcanic Zone, New Zealand. **Journal of Volcanology and Geothermal Research**, 346, 141-150.
36. Gravley, D.M., **Deering, C.D.**, Leonard, G.S., Rowland, J.V., 2016. Ignimbrite flare-ups and their drivers: A New Zealand perspective. **Earth-Science Reviews**, 162, 65-82.
37. Paulsen, T.S., **Deering, C.D.**, Sliwinski, J., Bachmann, O., Guillong, M., 2016. A continental arc tempo discovered in the Pacific-Gondwana margin mudpile? **Geology**, 44, 915-918.
38. Paulsen, T.S., **Deering, C.**, Sliwinski, J., Bachmann, O., Guillong, M., 2016. Detrital zircon ages from the Ross Supergroup, north Victoria Land, Antarctica: Implications for the tectonostratigraphic evolution of the Pacific-Gondwana margin. **Gondwana Research**, 35, 79-96.
39. **Deering, C.**, Keller, B., Schoene, B., Bachmann, O., Beane, R., Ovtcharova, M., 2016. Zircon record of the plutonic-volcanic connection and protracted rhyolite melt evolution. **Geology**, 44, 267-270.
40. *Rubin, A., Cooper, K.M., Leever, M., Wimpenny, J., **Deering, C.**, Rooney, T., Gravley, D., Yin, Q., 2016. Changes in magma storage conditions following caldera collapse at Okataina Volcanic Center, New Zealand. **Contributions to Mineralogy and Petrology**, 171, 1-18.
41. Kennedy, B., Stix, J., Hon, K., **Deering, C.**, *Gelman, S., 2015. Magma storage, differentiation and interaction at Lake City caldera, Colorado, USA. **The Geological Society of America Bulletin**, B31305.

42. *Graeter, K.A., Beane, R.J., **Deering, C.D.**, Gravley, D., Bachmann, O., 2015. Formation of rhyolite at the Okataina Volcanic Complex, New Zealand: New insights from analysis of quartz clusters in plutonic lithics. **American Mineralogist. Special Collection: Perspectives on origins and evolution of crustal magmas**, 100, 1778-1789.
43. *Bégué, F., Gravley, D., Chambefort, I., **Deering, C.**, Kennedy, B. 2015. Magmatic volatile distribution as recorded by rhyolitic melt inclusions in the Taupo Volcanic Zone, New Zealand. **Geological Society of London - Special Publication**, 410, SP410.
44. *Florence Bégué, Guilherme A. R. Gualda, Mark S. Ghiorso, *Ayla S. Pamukcu, Ben M. Kennedy, Darren M. Gravley, **Chad D. Deering** & Isabelle Chambefort 2014. Phase-equilibrium geobarometers for silicic rocks based on rhyolite-MELTS. Part 2: Application to Taupo Volcanic Zone rhyolites. **Contributions to Mineralogy and Petrology**, 168 (5), 1-16.
45. *Sarah E. Gelman, **Chad D. Deering**, Olivier Bachmann, Christian Huber, and Francisco J. Gutiérrez, 2014. Identifying the crystal graveyards remaining after large silicic eruptions. **Earth and Planetary Science Letters**, 403, 299-306.
46. Bachmann, O., **Deering, C.D.**, Lipman, P.W., *Plummer, C. 2014. Building zoned ignimbrites in recycling silicic cumulates: Insight from the 1000km³ Carpenter Ridge Tuff, CO. **Contributions to Mineralogy and Petrology**, 167 (6), 1-13.
47. *Bégué, F., **Deering, C.D.**, Gravley, D.M., Kennedy, B.M., Chambefort, I., Gualda, G.A., Bachmann, O. 2014. Extraction, storage and eruption of multiple isolated magma batches in the paired Mamaku and Ohakuri eruption, Taupo Volcanic Zone, New Zealand. **Journal of Petrology**, 55 (8), 1653-1684.
48. Cole, J.W., **Deering, C.D.**, Burt, R.M., Sewell, S., Shane, P.A.R., Matthews, N.E. 2014. Okataina Volcanic Centre, Taupo Volcanic Zone, New Zealand: a review of volcanism and synchronous pluton development in an active, dominantly silicic caldera system. **Earth Science Reviews**, 128, 1-17.
49. Rooney, T.O. and **Deering, C.D.** 2014. Conditions of melt generation beneath the Taupo Volcanic Zone: The influence of heterogeneous mantle inputs on large volume silicic systems. **Geology**, 42 (1), 3-6.
50. *Gelman, S.E., **Deering, C.D.**, Gutierrez, F.J., Bachmann, O. 2013. Evolution of the Taupo volcanic center, New Zealand: Petrological and thermal constraints from the Omega Dacite. **Contributions to Mineralogy and Petrology**, 166, 1355-1374.
51. **Deering, C.D.**, Horton, T.W., Gravley, D.M., Cole, J.W. 2012. Hornblende, cummingtonite, and biotite hydrogen isotopes: direct evidence of slab-derived fluid flux in silicic magmas of the Taupo Volcanic Zone, New Zealand. **Journal of Volcanology and Geothermal Research**, 233-234, 27-36.

52. Turnbull, R.E., **Deering, C.D.**, Tulloch, A.J., Weaver, S.D. 2012. Second boiling affects on Al-content of hornblende rims from exhumed Cretaceous arc plutons, Stewart Island, New Zealand. **American Mineralogist** 97, 1129-1144.
53. **Deering, C.D.**, Vogel, T.A., Patino, L.C., Szymanski, D.W., Alvarado, G.E. 2012. Magmatic processes that generate chemically distinct silicic magmas in NW Costa Rica and the evolution of continental crust in oceanic arcs. **Contributions to Mineralogy and Petrology**, 163, 259-275.
54. **Deering, C.D.**, Bachmann, O., Vogel, T.A. 2011. The Ammonia Tanks Tuff: Erupting a melt-rich rhyolite cap and its remobilized crystal cumulate. **Earth and Planetary Science Letters** 310, 518-525.
55. **Deering, C.D.**, Bachmann, O., Dufek, J., Gravley, D. 2011. Rift-Related Transition From Andesite to Rhyolite Volcanism in the Taupo Volcanic Zone (New Zealand) Controlled by Crystal-Melt Dynamics in Mush Zones With Variable Mineral Assemblages. **Journal of Petrology** 52, 2243-2263.
56. Bachmann, O., **Deering, C.D.**, Ruprecht, J., Huber, C., Skopelittis, A., Schnyder, C. 2012. Evolution of silicic magmas in the Kos-Nisyros volcanic center: cycles associated with caldera collapse. **Contributions to Mineralogy and Petrology** 163, 151-166.
57. Klemetti, E., **Deering, C.D.**, Cooper, K.M., Roeske, S.M. 2011. Magmatic perturbations in the Okataina Caldera Complex in the 10^3 - 10^5 year timescales recorded in single zircon crystals from the Mt. Tarawera region, New Zealand. **Earth and Planetary Science Letters**, 305 185-194.
58. **Deering, C.D.** and Bachmann, O. 2010. Trace element indicators of crystal accumulation in silicic rocks. **Earth and Planetary Science Letters** 297, 324-331.
59. Rooney, T., Sinha, A.K., **Deering, C.D.**, Briggs, C. 2010. A Model for the Origin of Rhyolites from South Mountain, PA: Implications for Rhyolites Associated with LIPS. **Lithosphere** 2, 211-220.
60. **Deering, C.D.**, Vogel, T.A., Cole, J.W., 2010. Extraction of crystal-poor rhyolite from a hornblende-bearing intermediate mush: a case study of the caldera-forming Matahina eruption, Okataina Volcanic Complex. **Contributions to Mineralogy and Petrology** 161, 129-151.
61. **Deering, C.D.**, Gravley, D.M., Vogel, T.A., Cole, J.W., Leonard, G.S., 2010. Origins of cold-wet-oxidizing to hot-dry-reducing magmatic cycles and distribution in the Taupo Volcanic Zone, New Zealand. **Contributions to Mineralogy and Petrology** 160, 609-629.
62. Cole, J.W., Spinks, K.D, **Deering, C.D.**, Nairn, I.A., Leonard, G.S., 2010. Volcanic and Structural Evolution of the Okataina Volcanic Centre, extensive dominantly silicic volcanism associated with the Taupo Rift, New Zealand. **Journal of Volcanology and Geothermal Research** 190, 123-135.

- 63. Deering, C.D.**, 2009. Cannibalization of an amphibole-rich andesitic progenitor induced by caldera-collapse during the Matahina eruption: Evidence from amphibole compositions. *American Mineralogist* 94, 1162-1174.
- 64. Deering, C.D.**, Cole, J.W., Vogel, T.A., 2008. A Rhyolite Compositional Continuum Governed by Lower Crustal Source Conditions in the Taupo Volcanic Zone, New Zealand. *Journal of Petrology* 49, 2245-2276.
- 65. Deering, C.D.**, Vogel, T.A., Patino, L.C., Alvarado, G.E., 2007. Origin of distinct silicic magma types from the Guachipelín Caldera, NW Costa Rica: Evidence for magma mixing and protracted subvolcanic residence. *Journal of Volcanology and Geothermal Research* 165, 103-126.

CONFERENCE PRESENTATIONS AND ABSTRACTS

1. **Deering, C.D.** Silicic cumulates: Fact or Fiction? 2018. **(Invited)** GSA Annual Meeting, Indianapolis, IN.
2. Elisabeth Bertollett, Darren Gravley, Rachel Beane, Guil Gualda, David Prior, Elizabeth Teeter, **Chad Deering** 2017. Compaction and fractionation revealed in a suite of plutonic lithics: a structural, textural and compositional study of the Akaroa Volcanic Complex, New Zealand. *IAVCEI*
3. Taya Flaherty, Tim Druitt, Gareth Fabbro, Fidel Costa, Katie Preece, **Chad Deering** (2017). Timescales of final magma chamber assembly prior to the Minoan eruption of Santorini from Fe-Mg diffusion chronometry in pyroxenes. *IAVCEI*
4. Thomas Garden, Darren Gravley, Isabelle Chambefort, **Chad Deering**, Ben Kennedy (2017). Calderas and their volcano-tectonic controls on hydrothermal fluid flow: A case study from Lake City caldera, Colorado, U.S.A. *IAVCEI*
5. Darren Gravley, Guilherme Gualda, **Chad Deering** (2017). High-resolution mantle-crust feedback demonstrated in a 'quick' ignimbrite flare-up, Taupo Volcanic Zone, New Zealand. *IAVCEI*
6. Lydia Harmon, Guilherme Gualda, Darren Gravley, **Chad Deering** (2017). Deciphering Whakamaru group storage conditions and magma mingling/coeruptive magma bodies via glass geochemistry and rhyolite-MELTS geothermobarometry. *IAVCEI*
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2016 Vanderbilt University
2015 University of Canterbury
2015 Colima, Mexico
2014 Georgia Technological University
2014 Michigan Tech Research Institute
2014 University of Lausanne, Switzerland, Magmatique Symposium
2013 University of Nevada-Reno, National Geothermal Institute
2013 Northern Illinois University
2012 University of Wisconsin-Milwaukee
2011 Central Michigan University
2010 Oregon State University
2010 Vanderbilt University
2009 University of Auckland, New Zealand
2008 University of Canterbury, New Zealand

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