

Curriculum Vitae

Daniel J. Rasmussen

Buck Postdoctoral Fellow, Dept. of Mineral Sciences
National Museum of Natural History, Smithsonian Institution
MRC-119, NHB • 10th & Constitution Ave. • Washington, DC 20560
646-691-8248 • daniel.j.rasmussen@gmail.com • danieljrasmussen.com

Updated: December 2019

Research Interests

I study overlapping problems in the fields of volcanism, magmatism, and tectonics to understand how volcanoes work and the origins and evolution of the continental crust. My work largely fits into two areas of focus. First, I investigate the spatiotemporal path of magma, particularly during eruption run-up, to improve knowledge of when, why, and how volcanoes erupt and the formation, location, and evolution of magma reservoirs. Second, I study magmatic volatiles and their role in magmatic systems. Central to my approach is the development of tools based on the chemical and textural analysis of macrocrysts, at both the individual and population scales. More specifically, I employ melt inclusion analysis, diffusion chronometry, experimental petrology, field investigation, and collaboration with other disciplines.

Education

- | | |
|------|--|
| 2019 | PhD, Columbia University
Dept. of Earth & Env. Sci., advised by Dr. Terry Plank |
| 2018 | MPhil, Columbia University
Dept. of Earth & Env. Sci. |
| 2014 | MS, New Mexico Tech
Dept. of Earth & Env. Sci., advised by Dr. Philip Kyle |
| 2012 | BS with Honors, University of Oregon
Dept. of Earth Science, advised by Dr. Paul Wallace |

Appointments

- | | |
|--------------|--|
| 2019-present | Peter Buck Postdoctoral Fellow, NMNH, Smithsonian Institution |
| 2014-2019 | Graduate Fellow, Columbia University |
| 2012-2014 | Research and Teaching Assistant, New Mexico Tech |

Research Projects

- | | |
|-----------|--|
| 2019-2021 | The long and short of run-up: Insights into the timing of volcanic eruption from a study of Volcán Arenal
Postdoctoral research. Collaborators: Elizabeth Cottrell, Benjamin Andrews. |
| 2014-2019 | The Aleutian arc through and through: Subduction dynamics and the generation, storage, and eruption of hydrous magmas
PhD dissertation. Collaborators: Terry Plank, Diana Roman, John Power, Cynthia Werner, others. |
| 2012-2014 | Understanding Magmatic and Volcanic Processes at Ross Island, Antarctica Using Olivine-Hosted Melt Inclusions
MS thesis. Collaborators: Philip Kyle, Kenneth Sims, Paul Wallace, Glenn Gaetani, others. |

2011-2012 **Cascade Arc Magma Genesis: Volatile and Major Element Indicators in Primitive Basalts from the Lassen Region**
Undergraduate honors thesis. Collaborators: Paul Wallace, Kristina Walowski.

Teaching Experience

Fall 2016, 2017 **TA for Geochemistry for a Habitable Planet (UN3101)**, Columbia University
 Spring 2016 **TA for Igneous Petrology (W4701)**, Columbia University
 Spring 2015 **TA for Solid Earth (W2200)**, Columbia University
 Fall 2013 **TA for Earth Processes (ERTH 101L)**, New Mexico Tech
 Spring 2013 **TA for Earth's Crust (ERTH 203L)**, New Mexico Tech

Field Studies

Sample collection and reconnaissance – Basin and Range (2018); Quizapu, Chile (2016); Aleutian Islands, Alaska (2016, 2015); Ross Island, Antarctica (2012); Valles Caldera, New Mexico (2012); Lassen Peak area, California (2011); North Sister, Oregon (2011)
Geologic mapping – Four Craters, Oregon; Frying Pan Gulch and Block Mountain near Dillon, Montana

Honors and Awards

2017 **Outstanding student presentation award**, IAVCEI General Assembly 2017
 2017, 2016 **Outstanding student presentation awards**, AGU Fall Meeting
 2017 **Chevron Initiative Research Grant**, Columbia University
 2017 **Sara F. Langer Book Prize**, Columbia University
 2016 **GeoPRISMS student prize for best poster**
 2016 **Kleinman Volcanological Research Grant**, United States Geological Survey
 2015 **Don Richter Memorial Scholarship**, Alaska Geological Society
 2015 **SOTA Travel Grant**, SOTA Organizers
 2014 **Eugene Cota-Robles Fellowship**, University of California, Santa Barbara (*declined*)
 2014 **Goldschmidt Travel Grant**, Geochemical Society
 2012 **James Stovall Fellowship**, University of Oregon

Professional Development

2019 **Oman ophiolite field course**, Oman
 2017 **CIDER 2017 Summer Program**, focus on Subduction Processes
 2016 **Workshops on Volcanoes**, Guatemala
 2016 **Quizapu workshop**, Chile
 2014 **SIMS workshop**, Arizona State University

Outreach and Service

2018-present **Judge for outstanding student presentations**, AGU, GeoPRISMS
 2017-present **Reviewer for journal articles and grant proposals**
 2019 **Session convener**, AGU Fall Meeting
 2015, 2019 **Moderator**, GeoPRISMS AGU mini workshop, SOTA 2015
 2014-2018 **Education demonstrations leader**, Lamont's Open House and Columbia's Girls' Science Day
 2015-2017 **Colloquium steering committee**, Schedule and host speakers for the Lamont-wide weekly colloquium

2015-2017	Founder and trip leader for NSOW and Winter Trips , Started and led two trips for Earth Science graduate students at Columbia University that are now traditions
2015-2016	Geochemistry seminar organizer , Schedule and host speakers for the weekly Geochemistry Division seminar at Lamont
2013-2016	Science Fair Judge , New Mexico Tech STEM Fair, NYSEF
2015	Organizer and moderator for First Year Symposium , Organize a day of talks for first year graduate students at Columbia University, moderate morning session
2013-2014	Volcano Lunch President , Organize volcano-related seminars, community service

Peer-Review Publications

Google Scholar profile: <https://goo.gl/cLqoMN>

Published

- Phillips, E.H., K. W. W. Sims, J. Blichert-Toft, R. C. Aster, G. A. Gaetani, P. R. Kyle, P. J. Wallace, **D. J. Rasmussen** (2018). The nature and evolution of mantle upwelling at Ross Island, Antarctica. *Earth and Planetary Science Letters*, 498, 38-53.
- Rasmussen, D. J.**, T. A. Plank, D. C. Roman, J. A. Power, R. J. Bodnar, E. H. Hauri (2018). When does eruption run-up begin? Multidisciplinary insight from the 1999 eruption of Shishaldin volcano. *Earth and Planetary Science Letters*, 486, 1-14.
- Rasmussen, D. J.**, P. R. Kyle, P. J. Wallace, K. W. W. Sims, G. A. Gaetani, E. H. Phillips (2017). Understanding degassing and transport of CO₂-rich alkali magmas at Ross Island, Antarctica using olivine-hosted melt inclusions. *Journal of Petrology*, 58 (5), 841-861.
- Walowski, K. J., P.J. Wallace, M. A. Clynnne, **D. J. Rasmussen**, D. Weis (2016). Slab melting and magma formation beneath the southern Cascade arc. *Earth and Planetary Science Letters*, 446, 100-112.

Submitted

- Sims, K. W. W., R. C. Aster, G. A. Gaetani, J. Blichert-Toft, E. H. Philips, P. J. Wallace, G. S. Mattioli, **D. J. Rasmussen**, E. S. Boyd (*in revision*). Mount Erebus Volcano: An Unparalleled Natural Laboratory to Study Alkaline Magmatism and Open-Conduit Volcano Behavior. *Volcanism in Antarctica: 200 Million Years of Subduction, Rifting and Continental Break-Up*.
- Rasmussen, D. J.**, T. A. Plank, P. J. Wallace, M. E. Newcombe, J. B. Lowenstern (*submitted*). Vapor bubble growth in olivine-hosted melt inclusions.

In preparation

- Rose-Koga, E.F., *et al.* (*in prep for submission in December 2019*). Silicate melt inclusions in the new millennium.
- Rasmussen, D. J.**, T. A. Plank, D. C. Roman (*in prep for submission in December 2019*). Magmatic water content controls magma storage depth.
- Werner, C. A., **D. J. Rasmussen**, T. A. Plank, P. J. Kelly, C. Kern, T. Lopez, J. Gliss, P. Izbekov, J. Lyons, D. Roman, J. Power (*in prep for submission in December 2019*). Linking subsurface to surface using gas emission and melt inclusion data at Mount Cleveland volcano, Alaska.
- Power, J. A., D. C. Roman, **D. J. Rasmussen**, M. Haney, T. A. Plank, J. Lyons, C. A. Werner (*in prep for submission in January 2020*). A Multi-Disciplinary Investigation of Cleveland and Tana Volcanoes and Holocene, Volcanic Vents on Chuginadak Island, Islands of Four Mountains, Alaska.
- Lopez, T. Fischer, T. A. Plank, A. Malinverno, A. Rizzo, **D. J. Rasmussen**, E. Cottrell, C. A. Werner, C. Kern, T. Ilanko, L. Buff, J. Andrys, K. Kelley (*in prep for submission in January 2020*). Volatile cycling within the Aleutian Arc: Isotopic constraints from subducted sediment inputs and volcanic gas outputs.
- Rasmussen, D. J.**, T. A. Plank, D. C. Roman, E. H. Hauri, H. A. Janiszewski, E. Lev, K. E. Nicolaysen, P. E. Izbekov (*in prep for submission in February 2020*). How slab depth is reflected in Aleutian arc magmas. *Invited to Journal of Volcanology and Geothermal Research*.

Delph, J. R., K. Shimizu, B. C. Ratschbacher, **D. J. Rasmussen**, X. Pu (*in prep for submission in January 2020*). Insights into the architecture of active continental arcs revealed by combined geochemical and seismic data.

Other Publications

Rasmussen, D. J., M. E. Newcombe (*in prep*). Review and synthesis of new understanding of magma plumbing and timescales from GeoPRISMS research. *Invited article for the final GeoPRISMS newsletter*.

Rasmussen, D. J., T. A. Plank, D. C. Roman (2019). The Aleutian arc through and through: How subduction dynamics influence the generation, storage, and eruption of volatile-bearing magmas. *Invited article for the GeoPRISMS spring 2019 newsletter (found [here](#))*.

Conference Abstracts

D. J. Rasmussen, T. Plank, D. Roman (2019). Magmatic water content controls magma storage depth. *AGU 2019 Fall Meeting Abstracts*, San Francisco, CA.

T. Lopez, T. Fischer, T. Plank, A. Malinverno, A. Rizzo, **D. J. Rasmussen**, E. Cottrell, C. Werner, C. Kern, T. Ilanko, L. Buff, J. Andrys, K. Kelley (2019). Along-arc variations in volatile cycling across the Aleutian arc. *AGU 2019 Fall Meeting Abstracts*, San Francisco, CA.

T. Lopez, T. Fischer, T. Plank, A. Malinverno, A. Rizzo, **D. J. Rasmussen**, E. Cottrell, C. Werner, C. Kern, T. Ilanko, L. Buff, J. Andrys, K. Kelley (2019). Volatile cycling within the Aleutian Arc: Isotopic constraints from subducted sediment inputs and volcanic gas outputs. *DCO 2019 Abstracts*, Washington, D.C.

Rasmussen, D. J., T. Plank, P. Wallace, M. Newcombe (2019). MIMiC: A new program to model vapor bubble growth in olivine-hosted melt inclusions. *Goldschmidt 2019 abstracts*, Barcelona, Spain.

Plank, T., **D. J. Rasmussen**, A. Aiuppa (2019). Constraints from Homogenized Melt Inclusions on Volcanic Degassing Paths and Mantle CO₂. *Goldschmidt 2019 abstracts*, Barcelona, Spain.

Rasmussen, D. J., T. Plank, D. Roman, M. Zimmer (2018). Magmatic water content controls magma storage depth (*invited*). *AGU 2018 Fall Meeting Abstracts*, Washington, DC.

Rasmussen, D. J., T. Plank, D. Roman, E. Hauri, H. Janiszewski, E. Lev, K. Nicolaysen, P. Izbekov (2018). How slab depth is reflected in Aleutian arc magmas. *AGU 2018 Fall Meeting Abstracts*, Washington, DC.

Rasmussen, D. J., T. Plank, D. Roman, M. Zimmer (2018). The link between magmatic water content and geophysically determined magma storage depth. *Cities on Volcanoes 10 Abstracts*, Naples, Italy.

Delph, J., K. Shimizu, **D. J. Rasmussen**, B. Ratschbacher, X. Pu (2018). A geochemical and seismic search for deep, active MASH zones. *Goldschmidt 2018 Abstracts*, Boston, MA.

Lopez, T., T. Fischer, T. Plank, A. Rizzo, **D. J. Rasmussen**, E. Cottrell, C. Werner, C. Kern, T. Ilanko, L. Buff, J. Andrys, K. Kelley (2017). New constraints on subduction inputs and volatile outputs along the Aleutian arc. *AGU 2017 Fall Meeting Abstracts*, New Orleans, LA.

Pu, X., J. Delph, K. Shimizu, **D. J. Rasmussen**, B. Ratschbacher (2017). Where do arc magmas differentiate? A seismic and geochemical search for active, deep crustal MASH zones. *AGU 2017 Fall Meeting Abstracts*, New Orleans, LA.

Rasmussen, D. J., T. Plank, D. Roman (2017). The run-up to volcanic eruption unveiled by forensic petrology and geophysical observations (*invited*). *AGU Fall Meeting Abstracts*, New Orleans LA.

Rasmussen, D. J., T. Plank (2017). Double, double toil and trouble: The melt inclusion bubble. *AGU 2017 Fall Meeting Abstracts*, New Orleans, LA.

Rasmussen, D. J., T. A. Plank, D. C. Roman, J. A. Power, R. J. Bodnar, E. H. Hauri (2017). When does eruption run-up begin? Multidisciplinary insight from the 1999 eruption of Shishaldin volcano. *VolcaNYC 2017 abstracts*, New York, NY.

Phillips, E.H., K. W. W. Sims, J. Blichert-Toft, R. C. Aster, P. R. Kyle, G. A. Gaetani, P. J. Wallace, **D. J. Rasmussen** (2017). The nature and evolution of mantle upwelling at Ross Island, Antarctica. *GSA 2017 Fall Meeting Abstracts*, Seattle, WA.

Plank, T. A., **D. J. Rasmussen**, L. Buff, E. Lev, D. Roman, E. Hauri, K. Nicolaysen, P. Izbekov (2017). The role of slab depth in the magma input to volcanic arcs. *IAVCEI 2017 General Assembly Abstracts*, Portland, OR.

Rasmussen, D. J., T. Plank, D. Roman, P. Izbekov (2017). Multidisciplinary insight into petrological indicators of eruption run-up. *IAVCEI 2017 General Assembly Abstracts*, Portland, OR.

Werner, C., C. Kern, D. Coppola, **D. J. Rasmussen**, P. Kelly, J. Lyons, K. Wallace, D. Schneider, R. Wessels, T. Lopez (2017). Linking gas emissions, lava extrusion, and melt S contents for a better understanding of shallow magmatic processes at Mount Cleveland volcano, Alaska. *IAVCEI 2017 General Assembly Abstracts*, Portland, OR.

- Rasmussen, D. J.**, T. Plank, D. Roman, A. Lough, P. Stelling, R. Bodnar, E. Hauri (2016). Run-up to the 1999 sub-Plinian eruption of Shishaldin volcano unveiled using petrologic and seismic approaches. *AGU 2016 Fall Meeting Abstracts*, San Francisco, CA.
- Roman, D. C., T. Plank, E. Hauri, D. Rasmussen, J. Power, J. Lyons, M. Haney, C. Werner, C. Kern, T. Lopez, P. Izbekov, P. Stelling (2016). From slab to surface: Origin, storage, ascent, and eruption of volatile-bearing magmas in the Aleutian arc. *AGU 2016 Fall Meeting Abstracts*, San Francisco, CA.
- Werner, C., C. Kern, D. Coppola, P. Kelly, **D. J. Rasmussen**, D. Schneider, K. Wallace, R. Wessels (2016). Linking surface and subsurface: Gas emission, lava extrusion, and inferred melt S contents from Mount Cleveland, Alaska. *AGU 2016 Fall Meeting Abstracts*, San Francisco, CA.
- Rasmussen, D. J.**, T. Plank, A. Lough, P. Stelling, D. Roman (2016). Petrologic chronology of the 1999 sub-Plinian eruption of Shishaldin Volcano. *JKASP 2016 Abstracts*, Fairbanks, AK.
- Phillips, E. H., K. W. W. Sims, J. Blichert-Toft, P. R. Kyle, G. A. Gaetani, P. W. Wallace, **D. J. Rasmussen** (2015). Sr-Nd-Hf isotopes reveal the nature and evolution of mantle upwelling at Ross Island, Antarctica. *Goldschmidt 2015 Abstracts*, Prague, CZ.
- Rasmussen, D. J.**, P. R. Kyle, P. J. Wallace, K. W. W. Sims, G. A. Gaetani, E. H. Phillips (2015). Volatile variations in olivine-hosted melt inclusions: Insight into the assembly, transport, and degassing of CO₂-rich magmas. *SOTA 2015 Abstracts*, Montserrat.
- Rasmussen, D. J.**, P. R. Kyle, P. J. Wallace, K. W. W. Sims, E. H. Phillips, G. A. Gaetani (2014). Magmatic plumbing of Ross Island, Antarctica uncovered by melt inclusions from alkalic CO₂-rich magmas. *Goldschmidt 2014 Abstracts*, Sacramento, CA.
- Rasmussen, D. J.**, P. R. Kyle, P. J. Wallace (2013). Using melt inclusions to trace the evolution of primitive alkalic magmas from Ross Island, Antarctica. *AGU 2013 Fall Meeting Abstracts*, San Francisco, CA.
- Walowski, K.J., P. J. Wallace, E. H. Hauri, M. A. Clynne, J. Rea, **D. J. Rasmussen** (2013). Magma formation in hot-slab subduction zones: Insights from hydrogen isotopes in Cascade Arc melt inclusions. *AGU 2013 Fall Meeting Abstracts*, San Francisco, CA.
- Walowski, K., P. Wallace, M. Clynne, I. Wada, **D. J. Rasmussen** (2013). Magma Formation in Hot-Slab Subduction Zones: Insights from Volatile Contents of Melt Inclusions from the Southern Cascade Arc. *Mineralogical Magazine*, 77(5) 2441.
- Walowski, K. J., **D. J. Rasmussen**, P. J. Wallace, M. Clynne (2012). Understanding magma formation and mantle conditions in the Lassen segment of the Cascade Arc: Insights from volatile contents of olivine-hosted melt inclusions. *AGU 2012 Fall Meeting Abstracts*, San Francisco, CA.

Invited Seminar Talks

- | | |
|------|---|
| 2018 | Woods Hole Oceanographic Institution – Geochemistry/geophysics seminar |
| 2016 | Quizapu workshop |
| 2013 | New Mexico Tech – EES Brown Bag seminar |