

Samuel J. Mitchell (Ph.D)

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Education

2015 – 2018	University of Hawai'i at Mānoa, USA , Ph.D in Geology and Geophysics, GPA:4.0
Ph.D	<i>Deep submarine silicic volcanism: Conduit and eruptive dynamics of 2012 Havre eruption</i> Advisors: Prof. Bruce Houghton, Dr. Rebecca Carey
2011 – 2015	University of Bristol, UK , M.Sci Geology with Study Abroad, 1st class Honours
B.S / M.S	<i>Effects of temperature and grain size on the stability and dynamics of co-ignimbrite plumes</i> Advisors: Prof. Alison Rust, Dr. Julia Eychenne
2013 – 2014	University of California, Berkeley, USA , UCEAP student, GPA: 3.9
Exchange	Dept. of Earth and Planetary Science

Employment

2021 – present	Facilities Technician	University of Bristol
2020 – 2021	Associate Tutor in Geology	Edge Hill University
2020	Research Associate (<i>short term</i>)	University of Bristol
2019	Research Technician / Laboratory Assistant	University of Bristol
2016	Graduate Teaching Assistant	University of Hawai'i at Mānoa
2015 – 2018	Graduate Research Assistant	University of Hawai'i at Mānoa
2014	Undergraduate Laboratory Assistant	University of Bristol

Current/Ongoing Research Interests

Dynamics of submarine volcanism – lava flow propagation, volatiles in the crust and ocean, pumice rafts
Analogue experiments in fluid dynamics: secondary hydroeruptions, magma melt lenses, ash sedimentation
Conduit and eruptive dynamics, and clastic transportation during volcanic eruptions
Interpretive 3D seismic surveys of submarine volcano morphology, associated lava flows, and magma reservoirs

Publications (In review/revision)

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- Mitchell, S. J.**, Hudak, M. R., Bindeman, I. N., Carey, R. J., McIntosh, I. M., Houghton, B. F. & Rubin K. H. (*In revision*) Isotopic signatures of magmatic fluids and seawater within deep-sea silicic volcanic rocks, *Geochimica et Cosmochimica Acta*
- Mitchell, S. J.**, Fauria, K. Houghton, & Carey, R. J. (*In revision*), Sink or float: Microtextural controls on the fate of pumice deposition from submarine volcanic eruptions, *Bulletin of Volcanology: What Pyroclasts Can Tell Us?*
- Vásconez-Muller, A., Cashman, K., **Mitchell, S. J.** & Vasconez, J. (*In revision*), The 2.6–2.3 ka explosive eruptive period of the Pululahua dome complex, Ecuador: Insights from pyroclast analysis, *Bulletin of Volcanology: What Pyroclasts Can Tell Us?*

Publications

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- Gilbertson, M., Taylor, A., **Mitchell, S. J.** & Rust, A. (2020) A fluidisation mechanism for secondary hydroeruptions in pyroclastic flow deposits, *Frontiers in Earth Science: Volcanology*, v. 8, no. 324.
 - Sun, Q., Magee, C., Jackson, C. A. L., **Mitchell, S. J.** & Xie, X. (2020) How do deep-water volcanoes grow?, *Earth and Planetary Science Letters*, v. 542.
 - Mitchell, S. J.**, Houghton, B. F., Carey, R. J., Manga, M., Fauria, K., Jones, M. R., Conway, C. E., Soule, A. S., Wei, Z. & Giachetti, T. (2019) Submarine giant pumice: A window into the shallow conduit dynamics of a recent silicic eruption, *Bulletin of Volcanology*, v. 81, no. 7, p. 42.
 - Sun, Q., Jackson, C. A. L., Magee, C., **Mitchell, S. J.** & Xie, X. (2019) Extrusion dynamics of deep-water volcanoes revealed by 3D seismic data, *European Geophysical Union: Solid Earth*, v. 10, no. 5.
 - Mitchell, S. J.**, Biass, S., Houghton, B. F., Walker, B. H., Anderson, A., Bonny, E., Mintz, B. G., Turner, N., Frank, D., Carey, R. J. & Rosenburg, M. D. (2018) The interplay of clast size, vesicularity and secondary

fragmentation: An example from the 1.8 ka Taupo eruption, *Geological Society of America special paper*, v. 538, 17.

4. Manga, M., **Mitchell, S. J.**, Degruyter, W. & Carey, R. J. (2018) Transition of eruptive style: Pumice raft to dome-forming eruption at the Havre submarine volcano, *Geology*, v. 46, no. 12.
3. **Mitchell, S. J.**, McIntosh, I. M., Houghton, B. F., Carey, R. J. & Shea, T. (2018) Dynamics of a powerful deep submarine eruption recorded in H₂O contents and speciation in rhyolitic glass: The 2012 Havre eruption, *Earth and Planetary Science Letters*, v. 494, p. 135-147.
2. Manga, M., Fauria, K., Lin, C., **Mitchell, S. J.**, Jones, M., Conway, C. E., Degruyter, W., Hosseini, B., Carey, R. J., Cahalan, R., Houghton, B. F., White., J. D. L., Jutzeler, M., Soule, S. A. & Tani, K. (2018) The pumice raft-forming 2012 Havre submarine eruption was effusive, *Earth and Planetary Science Letters*, v. 489, p. 49-58.
1. Carey, R. J., Soule, S. A., Manga, M., White, J. D. L., Wysoczanski, R., Jutzeler, M., McPhie, J., Tani, K., Fornari, D., Caratori-Tontini, F., Houghton, B. F., **Mitchell, S. J.**, Ikegami, F., Murch, A., Fauria, K., Conway, C., Jones, M., Cahalan, R. & McKenzie, W. (2018) The largest deep ocean silicic volcanic eruption of the past century, *Science Advances*, v. 4, no. 1.

Awards and Funding

2019	AGU Fall Meeting 2018: Outstanding Student Presentation Award, VGP	
2018	Ocean Discovery Fellow, NOAA 2018 National Ocean Exploration Forum	(US\$ 800)
2018	Lipman Award, GSA Student Research Grant: Melt inclusion SIMS analysis	(US\$ 3100)
2018	Fred M. Bullard Graduate Fellowship: Stable isotope volatile geochemistry	(US\$ 3350)
2018	UH Mānoa Graduate Student Organisation: Conference Travel Grant	(US\$ 357)
2017	UH Mānoa Office of Graduate Education: Achievement Award	(US\$ 1500)
2017	AGU Chapman Conference on Submarine Volcanism: Best Student Poster Award	
2016	UH Mānoa Graduate Student Organisation: International Research Grant	(US\$ 795)
2016	AGU Chapman Conference: Early-Career Researcher Travel Grant	(US\$ 1000)

Teaching Experience

Fall 2020	Co-lecturing at Edge Hill University	GEO2044, Igneous Petrology
Fall 2020	Co-lecturing at Edge Hill University	GEO1050, Dynamic Earth
Fall 2020	Co-lecturing at Edge Hill University	GEO1052, Earth Materials
Fall 2020	Tutoring at Edge Hill University	IFP1010, Introduction to Geology
Spring 2016, 2017	Co-instruction of Volcanic Crises Awareness course, NDPTC, FEMA	
Spring 2016	Teaching Assistant at University of Hawai'i	GG101L, Dynamic Earth Laboratory
Fall 2015 – 2017	Teaching Support at University of Hawai'i	GG300, Volcanology

Student supervision/Laboratory assistants

2021 – present	Jacob Nash	M.Sc student	University of Bristol, Co-supervisor
2021 – present	Various (3)	B.Sc summer student(s)	University of Bristol, Co-supervisor
2016 – 2018	Zachary Langdalen	Laboratory assistant	University of Hawai'i, Supervisor
2015 – 2016	Warren McKenzie	Laboratory assistant	University of Hawai'i, Supervisor
2015 – 2016	Hannah Azouz	Laboratory assistant	University of Hawai'i, Supervisor

Field Experience

Taupo and Tarawera, New Zealand – Explosive volcanism	2 weeks	2016
Kilauea and Mauna Loa, Hawai'i – Lava flows and explosive volcanism	1 weeks	2016
Kilauea, Mauna Loa and Mauna Kea, Hawai'i – Natural hazards	2 weeks	2015-17
Syros & Santorini, Greece – Explosive volcanism & subduction metamorphism	2 weeks	2014
Berkeley Hills, California – Field geology and digital mapping (8 hr/week)	13 weeks	2014
Kinlochleven and Ullapool, Scotland - Geological mapping	5 weeks	2013
Andalucia, Spain – Sedimentary basins & Miocene volcanics	1 week	2013
Pembrokeshire, Wales – Geological mapping	1 week	2012

Research Cruise Experience

- 2022, 5 weeks (Upcoming) ROV sampling and surveying of the Northern and Southern Galapagos platforms: Lava flows and coral reefs, *R/V James Cook, NOC-UK*
- 2019, 5 weeks 3D and 2D seismic reflection survey of Axial Volcano, USA, *R/V Marcus G. Langseth, Lamont-Doherty Earth Observatory*. Operations: seismic reflection surveying, multibeam, echosounding and XBT profile collection
- 2015, 4 weeks Mapping, exploration and sampling at the submarine Havre Volcano, Kermadec Ridge, NZ, through the use of *Jason* ROV and *Sentry* AUV aboard the *R/V Roger Revelle, Scripps*. Operations: ROV, AUV, gravity coring, sediment grabs, ship-based multibeam collection.

Seminars/ Conference Talks

- VMSG 2021 Isotopic signatures of magmatic fluids and seawater within silicic submarine deposits, *VMSG annual meeting 2021, virtual*.
- AGU 2019 The fate of pumice from large submarine eruptions: Microtextural differences and their control on clast transportation and depositional processes, *AGU Fall Meeting*
- AGU 2019 The fate of magmatic gases during deep-sea volcanic eruptions: Implications for lava domes, hydrothermal systems and mineral ore deposits, *AGU Fall Meeting, (Invited eLightning)*
- U. Bristol 2019 Mapping, sampling and understanding large, recent submarine eruptions, *Research seminar at University of Bristol*
- VMSG 2019 Sink or swim: Eruptive controls on the formation and longevity of pumice rafts with implications for the submarine geologic record, *VMSG annual meeting 2019, St. Andrews*.
- UH Mānoa 2018 Rapid Rehydration of Submarine Pumice: Resolving Unknown Sources Using Stable Isotopes, *Fellowship recipient seminar at University of Hawai'i*
- U. Oregon 2018 The largest deep submarine silicic eruption in modern history, *Departmental seminar at University of Oregon*
- AGU 2017 Breakin' up is hard to do: Fragmentation mechanisms of the 2012 submarine Havre eruption, *AGU Fall Meeting*.
- IAVCEI 2017 Giant Pumice: A window into the physical and geochemical heterogeneity of a deep submarine silicic volcanic conduit, *IAVCEI 2017*.
- GSA 2017 Magma chamber to the ocean surface: What water tells us about pre- and syn-eruptive submarine volcanic processes, *GSA Cordilleran Section Meeting 2017 Honolulu, HI*.
- VMSG 2017 Syn-eruptive hydration of a deep-submarine explosive eruption: Water speciation analysis of volatiles in rhyolitic glass, *VMSG-TSG-BGA, Liverpool Joint Assembly 2017*.

Convened sessions / Committee roles

- GSA 2017 Rubin, K. & Mitchell, S. J. Submarine Volcanism in Hawai'i and Elsewhere, *GSA Cordillera Meeting 2017, Honolulu, HI*.
- Chapman 2017 Invited early-career-researcher panellist during discussion on: The Next Decade of Research in Submarine Volcanism, *AGU Chapman Conference on Submarine Volcanism: New Frontiers and Approaches*.
- GSO 2017-18 University of Hawai'i Graduate Student Organization representative for the Dept. Geology and Geophysics

Workshops Attended

- AGU 2019 CONVERSE Eruption Dynamics
- CIDER 2019 Volcanoes: 4-week lecture and practical workshop (Early Career participant)
- AGU 2017, 2019 Social Media for Scientists in Geoscience – AGU Sharing Science
- AGU 2018 IODP Pre-proposal workshop: Silicic submarine calderas in the Kermadec Arc
- AHOD 2018 National Oceanic Exploration Forum 2018: All Hands On Deck, MIT Media Lab
- AGU 2015 Volcanic Crises Awareness course, NDPTC, FEMA

Analytical and Experimental Experience / Skills

<i>SEM / EDS</i>	Microtextural image acquisition and element identification
<i>Electron Microprobe</i>	Microtextural image acquisition and geochemical composition
<i>Analogue experiments</i>	Sedimentation, melt lenses, volcanic plumes, granular beds, fluidisation
<i>Image analysis</i>	Use of Fiji-App (ImageJ) and A. Photoshop to process 2D BSE images and CT slices
<i>High Speed Imagery</i>	High-speed thermal and visible imagery of analogue experiments
<i>MATLAB</i>	Volcanic conduit modelling and diffusion modelling
<i>µRaman Spectroscopy</i>	Volatile concentrations, fluorescence, and crystal identification in silicates
<i>FTIR Spectroscopy</i>	Volatile concentrations, hydrocarbon contaminants and speciation in silicates
<i>SIMS</i>	Volatile concentrations and isotopes in silicates
<i>TC/EA</i>	Stable H and O isotope analysis of volatile components and silicate glasses
<i>He-pycnometry</i>	Isolated and connected porosity of porous rocks
<i>Conical rheometer</i>	Rheology of inviscid and viscous Newtonian and non-Newtonian fluids
<i>Capillary flow porometry</i>	Permeability of volcanic rocks

Select Geoscience Communication / Outreach

2020	Contributor to Earth_Live_Lessons, Science_Mom, Going_Places and Volcano_Moments – remote science communication initiatives set up during the COVID-19 crisis.
2020	Researcher – Supervolcanoes documentary (<i>TBD</i>), Wildflame Productions for Discovery Network
2020	Specialist Researcher – Volcanoes documentary (<i>TBD</i>), Back2Back Productions for BBC Earth
2019	Organization of a New York Times Science cover story article for an NSF research expedition
2019	Outreach co-ordinator for the NSF 3D Seismic Expedition to Axial Volcano
2019	Featured scientist in a NOVA PBS documentary – Hawai'i: Kilauea on Fire
2018	Leading of a public Q&A session on submarine volcanoes at the New England Aquarium during the 2018 National Oceanic Exploration Forum (all ages in attendance)
2015–17	Social media co-ordinator for MESH expedition 2015 and AGU Chapman Conference on Submarine Volcanism, <i>Hobart, Tasmania, 2017</i> .

Featured in the news/media

2019	The New York Times - A 3D Encounter With a Violent Volcano's Underbelly: https://www.nytimes.com/2019/12/18/science/volcano-3d-reunion-island.html
2019	The New York Times (Cover Story) - A Deep-Sea Magma Monster Gets a Body Scan: https://www.nytimes.com/2019/12/03/science/axial-volcano-mapping.html
2019	Gizmodo - Scientists Witness the Birth of a Submarine Volcano for the First Time: https://gizmodo.com/scientists-witness-the-birth-of-a-submarine-volcano-for-1834990629
2018	The New York Times - A Vault of Glass and the Deepest Volcanic Eruption Ever Detected: https://www.nytimes.com/2018/10/30/science/deep-sea-volcano.html
2018	IFL Science - The Largest Deep-Ocean Eruption In History Was Really Quite Bizarre: https://www.iflscience.com/environment/largest-deeпоcean-eruption-history-really-quite-bizarre/all/
2017	AGU Blogosphere: In the field – Lauren and the giant pumice: https://blogs.agu.org/thefield/2017/02/16/lauren-giant-pumice/

Conference Abstracts (included in)

AGU 2019	Mitchell , et al. Showcasing the life of scientists at sea through social media: Challenges and methods of connecting the public with off-shore scientists, <i>AGU Fall Meeting, Poster (Public Affairs)</i>
CIDER 2019	Mitchell , et al. Completing the eruptive record of a large submarine volcanic eruption: Microtextures of pumice from the sea surface and the seafloor, <i>CIDER summer workshop 2019, Volcanology, Poster</i>
AGU 2018	Mitchell , et al. Resolving rehydration in pumice: Methods for deriving original H ₂ O content and quenching pressures using H ₂ O speciation and H isotope analysis, <i>AGU Fall Meeting, Poster (OPSA awarded)</i>
GSA 2017	Mitchell , et al. The interplay of clast size, vesicularity and secondary fragmentation, <i>GSA Cordilleran Section Meeting 2017 Honolulu, Poster</i> .
Chapman 2017	Mitchell , et al. Reconstructing the evolution of the submarine Havre eruption, 2012: Insights from vesicularity, water concentrations and microtextural analysis of rhyolitic glass, <i>AGU</i>

Chapman Conference on Submarine Volcanism: New Frontiers and Approaches, Poster (BSPA awarded)

- AGU 2016 **Mitchell**, et al. Investigating syn- vs. post-eruption hydration mechanisms of the 2012 Havre submarine explosive eruption: Water speciation analysis of pumiceous rhyolitic glass, *AGU Fall Meeting, Poster*.
- AGU 2015 **Mitchell**, et al. Exploring the effects of temperature and grain size on plumes associated with PDCs through analogue experimentation, *AGU Fall Meeting, Poster*.
- AGU 2019 Arnulf, et al. Imaging the internal workings of Axial Seamount on the Juan de Fuca Ridge, *AGU Fall Meeting, Invited poster*
- AGU 2019 Mutch, et al. Re-evaluating the crustal contribution to volcanism along the Izu-Bonin arc: a geospatial and geochemical approach, *AGU Fall Meeting, Poster*
- AGU 2019 Rust, et al. The power and limitations of analogue experiments of pyroclast fluidization and segregation: Applications to ash venting and secondary pyroclastic eruptions, *AGU Fall Meeting, Invited talk*
- EGU 2019 Manga, et al. Transition of eruptive style: Pumice raft to dome-forming eruption at the Havre submarine volcano, *EGU General Assembly 2019, Talk*.
- AGU 2018 McIntosh, et al. Investigating submarine eruption dynamics using water contents of submarine pyroclasts, *AGU Fall Meeting, Poster*
- AGU 2018 Manga, et al. Transition of eruptive style: Pumice raft to dome-forming eruption at the Havre submarine volcano, *AGU Fall Meeting, Poster*
- AOGS 2018 Carey, et al The role of the ocean and modulating the dynamics of silicic submarine volcanic eruptions, *Asia Oceania Geosciences Society Annual Meeting 2018, Invited Talk*
- EGU 2018 Manga, et al. The pumice raft-forming 2012 Havre submarine eruption was an effusive eruption, *EGU General Assembly 2018, Talk*.
- AGU 2015 Carey, et al. Stratigraphic relationships and timing of the 2012 Havre submarine silicic volcanic eruption revealed by high resolution bathymetric mapping and observations by underwater vehicles, *AGU Fall Meeting, Invited Talk*.

Affiliations

2016 – present	Member of Golden Key International Honour Society
2016 – present	Member of IAVCEI
2015 – present	Member of the Geological Society of America
2015 – present	Member of European Geophysical Union
2013 – present	Member of American Geophysical Union
2009 – present	Fellow at The Geological Society, London (previously candidate & junior candidate)