# ANDREW C. GASE

GEOPHYSICS, TECTONOPHYSICS, VOLCANOES

I use seismic and electromagnetic geophysical methods to probe the earth at lithospheric and environmental scales. My recent interests include subduction zone structure, volcanic geomorphology, and magmatic-tectonic interactions.

University of Texas at Austin
Institute for Geophysics
Jackson School of Geosciences
10100 Burnet Rd, Austin, TX 78758
agase@utexas.edu

## EDUCATION

**Ph.D.** Geological Sciences, University of Texas at Austin – Spring 2023 (anticipated)
Dissertation title: "Seismic investigations of subduction and intraarc rifting at the Hikurangi margin"
Advisors: Harm Van Avendonk and Nathan Bangs
Committee: Jaime Barnes, Kyle Spikes, Nicola Tisato, Dan Bassett

**M.S.** Geophysics, Boise State University – May 2017
Thesis title: "Geophysical investigations of pyroclastic density current processes and deposit properties at Mount St. Helens, Washington (USA)"
Advisors: Brittany Brand and John Bradford
Committee: Lee Liberty

**B.S.** Earth and Atmospheric Sciences, Georgia Institute of Technology – May 2014

## APPOINTMENTS

[2018-present] Graduate Research Assistant, University of Texas at Austin
[2017-present] Graduate Fellow, University of Texas at Austin
[2014-2016] Graduate Teaching Assistant, Boise State University
[2013-2014] Undergraduate Research Assistant, Georgia Tech
[2011-2013] Materials Laboratory Assistant, Nanotechnology Research Center, Georgia Tech

## PEER-REVIEWED PUBLICATIONS

3. **Gase, A. C.**, H. J. A. Van Avendonk, N. L. Bangs, T. W. Luckie, D. H. N. Barker, S. A. Henrys, D. Bassett, D. A. Okaya, K. M. Jacobs, S. Kodaira, G. Fujie, A. Arnulf, Y. Yamamoto, 2019, Seismic evidence of magmatic rifting in the offshore Taupo Volcanic Zone, New Zealand, *Geophysical Research Letters,* 46, 12,949–12,957, https://doi.org/10.1029/2019GL08526.
2. **Gase, A. C.**, J. H. Bradford, B. D. Brand, 2018, Estimation of porosity and water saturation in dual porosity pyroclastic deposits from joint analysis of compression, shear, and electromagnetic velocities, *Geophysics,* 83 (3), https://doi.org/10.1190/geo2017-0234.1.
1. **Gase, A. C.**, B. D. Brand, and J.H. Bradford, 2017, Evidence of erosional self-channelization of pyroclastic density currents revealed by ground-penetrating radar imaging at Mount St. Helens, Washington (USA), *Geophysical Research Letters,* 44, 2220–2228, https://doi.org/10.1002/2016GL072178.

**In Prep:**

Crustal structure of the Northern Hikurangi Margin, New Zealand: Variable accretion and upper plate strength influenced by rough subduction. For *Journal of Geophysical Research: Solid Earth*.

## SCIENTIFIC ABSTRACTS

### Oral Presentations

6. **Gase, A.**, Van Avendonk, H. J., Bangs, N. L., Okaya, D. A., Henrys, S. A., Barker, D. H. N., Jacobs, K., Kodaira, S., Fujie, G. Crustal structure of the northern Hikurangi margin and Bay of Plenty from marine seismic reflection imaging and double-sided onshore-offshore seismic tomography. American Geophysical Union Fall Meeting, Washington, D.C., December 2018.
5. Bangs, N. L., Van Avendonk, H. J., Arnulf, A. F., **Gase, A.,** Henrys, S. A., Okaya, D. A., Barker, D. H. N., Jacobs, K., Fujie, G., Arai, R. Large underplated structures along the southern Hikurangi margin: Preliminary results from the SHIRE

seismic imaging experiment. American Geophysical Union Fall Meeting, Washington, D.C., December 2018.

4. Brand, B. D., N. M. Pollock, **A. C. Gase**, D. Sarocchi, and O. Roche, The erosive nature of pyroclastic density currents – A summary of findings from the 18 May 1980 Mt. St. Helens (USA) deposits, IAVCEI Scientific Assembly, Portland, Oregon, August 2017.
3. **Gase, A. C.**, B. D. Brand, J. H. Bradford, Erosional self-channelization of pyroclastic density currents – Evidence from ground-penetrating radar imaging at Mt. St. Helens, Washington (USA). American Geophysical Union Fall Meeting, San Francisco, California, December 2016.
2. **Gase, A. C.**, J. H. Bradford, B. D. Brand, D. Gravley, S. Hampton, A. Dougherty, GPR investigation of pyroclastic density current deposits at Mount St Helens, Washington. 2nd Near Surface Asia Pacific Conference, Society for Exploration Geophysics, Waikoloa, Hawaii, July 2015.
1. Mendez-Harper, J., **A. C. Gase**, J. Dufek, and J. McAdams, The formation of bomb-sags during phreatic eruptions. 5th International Maar Conference, Queretaro, Mexico, November 2014.

**Posters**

5. Luckie, T., **A. C. Gase**, K. Jacobs, S. A. Henrys, D. A. Okaya, H. J. Van Avendonk, N. L. Bangs et al. Initial wide-angle seismic results from the Seismogenesis at Hikurangi Integrated Research Experiment (SHIRE), North Island, New Zealand. American Geophysical Union Fall Meeting, San Francisco, California, December 2019.
4. **Gase, A. C.**, N. L. Bangs, H. J. Van Avendonk, T. Luckie, D. H. N. Barker, D. Bassett, K. Jacobs et al. Subduction of rough seafloor facilitates sediment underplating beneath a low velocity prism. American Geophysical Union Fall Meeting, San Francisco, California, December 2019.
3. Brand, B. D., N. M. Pollock, **A. C. Gase**, D. Sarocchi, O. Roche, The erosive nature of pyroclastic density currents – A summary of findings from the 18 May 1980 Mt St Helens (USA) deposits with implications for future work. Cities on Volcanoes 9, Puerto Varas, Chile, November 2016.
2. **Gase, A. C.**, J. H. Bradford, B. D. Brand, Ground penetrating radar and active seismic investigation of stratigraphically verified pyroclastic deposits. American Geophysical Union Fall Meeting, San Francisco, California, December 2015.
1. **Gase, A.C.**, J. H. Bradford, B. D. Brand, D. Gravley, S. Hampton, A. Dougherty, GPR investigation of pyroclastic density current deposits at Mount St Helens, Washington. IUGG Annual Meeting, Prague, Czech Republic, June 2015.

## TEACHING EXPERIENCE

[2016] Field methods in volcanology TA, Boise State University, 1 semester
[2016] Geoscience communication TA, Boise State University, 1 semester
[2015] Introduction to geophysics TA, Boise State University, 1 semester
[2014-2015] Fundamentals of geoscience TA, Boise State University, 2 semesters

## SERVICE

Peer reviewer: *Geomorphology, Journal of Geophysical Research: Solid Earth*

[2020-present] University of Texas Graduate Student Assembly, Geosciences representative
[2019] Break-out discussion facilitator, "Linking geophysical imaging to active composition/state/properties", GeoPRISMS AGU Mini-Workshop: Strategies for Synthesis, Integration, & Future Opportunities.
[2019] Oral session co-chair, "Interplay between structure, fluids, and deformation processes at subduction zones" AGU fall meeting
[2015] AGU Fall meeting student volunteer
[2015] Activity leader, GeoGirls, STEM summer camp at Mount St Helens for middle school girls

## AWARDS AND HONORS

[2019] GeoPRISMS AGU Student Prize, Honorable Mention for Poster Presentation
[2019] Early Grad. Best Poster, Student Research Symposium, University of Texas at Austin
[2018] GeoPRISMS AGU Student Prize, Honorable Mention for Oral Presentation
[2017-2021] Graduate School Fellowship, University of Texas at Austin
[2015] National Science Foundation Graduate Research Fellowship, Honorable Mention
[2015] Exxon Mobil Global Recruiting Award
[2015] Geological Society of America Student Research Award

[2015] IUGG Graduate Student Travel Award, IUGG General Assembly 2015, Prague
[2014] Graduate Residential Fellowship, Boise State University
[2014] Outstanding Undergraduate Research Award, Georgia Institute of Technology
[2014] President's Undergraduate Research Award, Georgia Institute of Technology
[2014] Rutt S. Bridges Undergraduate Research Initiative Award, Georgia Institute of Technology

**FIELD EXPERIENCE**

[2019] Alaska Amphibious Community Seismic Experiment, R/V Sikuliaq, ROV Jason, 23 days at sea
[2019] Seismogenesis at Hikurangi Integrated Research Experiment, onshore seismic explosion survey, 14 days
[2018] University of Texas, Marine geology and geophysics field course, Galveston Bay, 4 days at sea
[2018] Seismogenesis at Hikurangi Integrated Research Experiment, onshore seismograph recovery, 14 days
[2018] Seismogenesis at Hikurangi Integrated Research Experiment, R/V Langseth, 36 days at sea
[2014-2016] Investigations of pyroclastic current dynamics at Mount St. Helens, 3 field seasons.
[2014-2016] Surveying granite weathering in Idaho mountainous watersheds, seismic and ERT, 4 surveys
[2013-2014] Undergraduate field work studying phreatomagmatic volcanic deposits in the U.S. and Mexico

**WORKSHOPS AND SHORT COURSES**

[2019] GeoPRISMS AGU Mini-Workshop: Strategies for Synthesis, Integration, & Future Opportunities, S.F., CA.
[2019] GeoPRISMS TEI and Synthesis, San Antonio, TX
[2018] GeoPRISMS Investigating subduction processes at the Hikurangi Margin, New Zealand
[2016] Deep Submergence new users' program, San Francisco, CA
[2015] P-P azimuthal anisotropy on-line short course, Houston Geophysical Society
[2015] Melts, glasses, and magmas short course, LMU, Munich, Germany

**INVITED PRESENTATIONS**

[2019] GNS Science, New Zealand