

Scott Thomas Henderson

Earth & Space Sciences Research Associate
eScience Postdoctoral Fellow
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Profile

Ph.D. in Geological Sciences with several years of postdoctoral experience in industry and academia. Expertise in data science, satellite remote sensing, and geospatial data analysis. Research interests include developing strategies for monitoring and mitigating terrestrial natural hazards.

Education

Ph.D. Geological Sciences	Cornell University (May 2015)	Ithaca, NY
B.A. Physics, <i>Cum Laude</i> , $\Phi\beta\kappa$	Lewis & Clark College (May 2008)	Portland, OR

Work Experience

eScience Data Science Postdoctoral Fellow (2017 - present)

Location: University of Washington, Seattle, WA

Designing Cloud-native scalable processing and analysis of satellite radar imagery for earthquake, volcano, and landslide monitoring in the Pacific Northwest. Implementing unsupervised classification and transient detection of earth surface movements in geodetic imagery.

Postdoctoral Researcher (2016 - 2017)

Location: Universidad de los Andes, Bogotá, Colombia

Investigated surface deformation with Sentinel-1 Interferometric Synthetic Aperture Radar (InSAR) and finite element modeling. Developed tools for natural hazard and aquifer monitoring in Colombia.

Geophysicist (2015 - 2016)

Location: Chevron Energy Technology Company, Houston, TX

Processed 2D and 3D active-source seismic data for onshore and offshore exploration. Investigated limits of imaging fracture systems using finite difference wave-propagation code.

Ph.D. Researcher (2008 - 2015)

Location: Cornell University, Ithaca, NY

Thesis: Quantifying the properties of magmatic intrusions in the Central Andes with geodesy

Generated maps of two decades worth of surface deformation measurements in the Andes of Chile, Peru, Bolivia, and Argentina; modeled magmatic reservoirs with inverse and finite element models based on deformation data; published results in several peer-reviewed journals.

Physical Science Technician (2008 - 2009)

Location: US Geological Survey (USGS) Cascade Volcano Observatory, Vancouver, WA

Developed a graphical user interface for 2D and 3D numerical models of debris-flows, incorporated into a USGS official software release.

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Awards and Grants

- NASA ACCESS Grant (2018)
- NSF Earth Science Grant (2018)
- National Geographic Explorer / Waitt Grant (2017)
- NASA Earth & Space Science Graduate Research Fellowship (2010 - 2013)

Technical Skills

InSAR processing (ISCE, GMTSAR)

Cloud computing (AWS, GCP)

Numerical programming (Python)

Open-source GIS (GDAL, GMT, QGIS)

Finite element modeling (Pylith, Comsol)

GUI development (Python)

Version control software (Git/Github)

Selected Publications

- **Henderson, S.T.**, F. Delgado, J.E. Elliott, M.E. Pritchard, T. Lopez, (2017), Decelerating uplift at Lazufre Volcanic Center, Central Andes, from 2010-2016, and implications for geodetic models, *Geosphere*, 13(5) 1489-1505, [doi:10.1130/GES01441.1](https://doi.org/10.1130/GES01441.1).
- **Henderson, S.T.**, M.E. Pritchard (2017), Time dependent deformation of Uturuncu Volcano, Bolivia constrained by GPS and InSAR measurements and implications for source models, *Geosphere*, [doi:10.1130/GES01203.1](https://doi.org/10.1130/GES01203.1)
- Gottsmann, J., Blundy, J., **Henderson, S.T.**, Pritchard, M.E., and Sparks, R.S.J., (2017), Thermo-mechanical modeling of the Altiplano-Puna deformation anomaly: Multiparameter insights into magma mush reorganization: *Geosphere*, v. 13, no. 3, p. 1–24, [doi:10.1130/GES01420.1](https://doi.org/10.1130/GES01420.1).
- Perkins, J. P., Finnegan, N.J., **Henderson, S.T.**, Rittenour, T.M. (2016) Topographic constraints on magma accumulation below the actively uplifting Uturuncu and Lazufre volcanic centers in the Central Andes, *Geosphere*, 12(4):1078, [doi:10.1130/GES01278.1](https://doi.org/10.1130/GES01278.1)
- **Henderson, S. T.** (2015). Quantifying the properties of magmatic intrusions in the Central Andes with geodesy. Cornell University, [Ph.D. Thesis](#).
- Reid, M.E., Christian, S.B., Brien, D.L., and **Henderson, S.T.**, (2015), Scoops3D: Software to analyze 3D slope stability throughout a digital landscape: *U.S. Geological Survey Techniques and Methods*, book 14, chap. A1, 218 p., [doi:10.3133/tm14A1](https://doi.org/10.3133/tm14A1).
- Pritchard, M. E., **Henderson, S.T.**, Jay, J.A., Soler, V., Krezesni, D., Button, N.E., Welch, M., Semple, A., Glass, B., Sunagua, M., Minaya, E., Amigo, A., and Clavero, J., (2014), Reconnaissance earthquake studies at nine volcanic areas of the Central Andes with coincident satellite thermal and InSAR observations: *Bulletin of Volcanology*, 90–103, [doi:10.1016/j.jvolgeores.2014.05.004](https://doi.org/10.1016/j.jvolgeores.2014.05.004).
- **Henderson, S. T.**, and Pritchard, M. E. (2013), Decadal volcanic deformation in the Central Andes Volcanic Zone revealed by InSAR time series, *Geochemistry Geophysics Geosystems*, 14(5), 1358–1374, [doi:10.1002/ggge.20074](https://doi.org/10.1002/ggge.20074).
- Pritchard, M. E., Jay J. A., Aron F., **Henderson S. T.**, and Lara L. E. (2013), Subsidence at Southern Andes volcanoes induced by the 2010 Maule, Chile earthquake, *Nature Geoscience*, 6(7), 1–5, [doi:10.1038/ngeo1855](https://doi.org/10.1038/ngeo1855).

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Service & Outreach

University of Washington Geohackweek Organizer (2018)

I help organize the annual "Geohackweek" at the University of Washington - a one-week participant-driven event with the goal of learning the latest open source software tools available to geoscientists.

InSAR Short Course Organizer (2016)

Coordinated and taught 3-day Interferometric Synthetic Radar (InSAR) short course at the Cities on Volcanoes 9 IAVCEI conference in Puerto Varas, Chile.

"Supervolcanoes" Museum Exhibit (2010 - 2011)

Designed bilingual (Spanish & English) posters, slideshow, and rock sample displays for the general public in a year-long exhibit at the Museum of the Earth in Ithaca, NY.

Invited Presentations

- Boise State Department Seminar (10/2018)
- UNAVCO/JPL InSAR Short Course (08/2018)
- UTIG Special Seminar (02/2017)

Conference Participation

American Geophysical Union (AGU)	3 oral, 5 poster	2009 - 2018
More-Sloan Data Science Environment Summit	2 oral	2017, 2018
Geological Society of America (GSA)	1 oral	2017
IAVCEI Cities on Volcanoes 9	workshop organizer	2016
STREVA InSAR Workshop	co-organizer	2016

Professional References

*Available upon request

Personal Statement

I am from the Pacific Northwest and draw inspiration from the natural world. I am endlessly amazed by the powerful insights provided by earth observation satellites. If I'm considering the view from satellites then I am exploring on ground, whether in my own backyard or abroad!