

Amanda Lough

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BUSINESS CONTACT

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EMPLOYMENT

- **Assistant Professor, Biodiversity, Earth, and Environmental Science** 2016-Present
College of Arts and Sciences, Drexel University Philadelphia, PA
- **Postdoctoral Fellow** 2014-2016
Department of Terrestrial Magnetism, Carnegie Institution for Science Washington D.C.

EDUCATION

- **Doctorate of Philosophy, Earth and Planetary Sciences** August 2014
College of Arts and Science, Washington University in St. Louis St. Louis, MO
Dissertation Title: "Studies of Seismic Sources in Antarctica using an Extensive Array of Broadband Stations"
Advisor: Douglas Wiens
- **Master of Arts, Earth and Planetary Sciences** August 2009
College of Arts and Science, Washington University in St. Louis St. Louis, MO
Thesis Title: "Detection of Long Period Seismic Sources with Rayleigh Waves: Applications in Antarctica"
Advisor: Douglas Wiens
- **Bachelor of Science, Geological Sciences** August 2007
College of Arts and Science, University of Missouri-Columbia Columbia, MO
Graduated Summa Cum Laude and with Departmental Honors
Advisor: Eric Sandvol

SCHOLARSHIP

- **Publications**
 - **Lough, Amanda**, Douglas Wiens, and Andrew Nyblade. "Reactivation of ancient Antarctic rift zones by intraplate seismicity". *Nature Geoscience*, 2018, doi:10.1038/s41561-018-0140-6.
 - **Lough, Amanda**, C. Grace Barcheck, Douglas Wiens, Sridhar Anandakrishnan, and Andrew Nyblade. "A previously unreported type of seismic source in the firm layer of the East Antarctic ice sheet". *Journal of Geophysical Research: Earth Surface*, 2015, doi:10.1002/2015JF003658.
 - **Lough, Amanda**, Douglas Wiens, Grace Barcheck, Sridhar Anandakrishnan, Richard Aster, Donald Blankenship, Audrey Huerta, Andrew Nyblade, Duncan Young, and Terry Wilson. "Seismic detection of an active subglacial magmatic complex in Marie Byrd Land, Antarctica". *Nature Geoscience*, 2013, doi:10.1038/NCEO1992.
- **Presentations**
 - "Intraplate earthquakes and deformation within the East Antarctic craton". American Geophysical Union Fall Meeting 2017, New Orleans, LA, December 11-15.
 - "Quaking Ice: The Seismicity of Antarctica Revealed by a Regional Seismic Network", Drexel University Department of Biodiversity, Earth and Environmental Science weekly graduate research seminar series, Philadelphia, PA, April 27, 2017.

- "Quaking Ice: The Seismicity of Antarctica Revealed by a Regional Seismic Network", Temple University Earth and Environmental Science Department weekly seminar series, Philadelphia, PA, February 3, 2017.
- "Deep Long Period Earthquakes: Peaking at the Roots of Volcanic Systems", Drexel University Department of Biodiversity, Earth, and Environmental Science, March 3, 2016.
- "Deep Long Period Earthquakes: Peaking at the Roots of Volcanic Systems", Texas Tech University Department of Geosciences, February 4, 2016.
- "Studies of Seismic Sources in Antarctica" invited talk at AVO (Alaska Volcano Observatory), Anchorage, AK, March 24, 2015.
- "Studies of Seismic Sources in Antarctica" DTM weekly seminar series, February 5, 2015.
- "Antarctic seismic sources recorded by recent large-scale seismograph deployments" at SCAR (Scientific Committee on Antarctic Research) Open Science Conference, Auckland, New Zealand, August 25-28, 2014.
- "Report on the Seismicity of Antarctica" at the ANET/POLENET 2013 Workshop at Ohio State University, Columbia, OH, November 4-6, 2013.
- **Poster Abstracts (First Author)**
 - "East Antarctic intraplate earthquakes recorded by the AGAP/GAMSEIS temporary seismic array delineate possible ancient rift". American Geophysical Union Fall Meeting 2016, San Francisco, CA, December 12-16, 2016.
 - "Intraplate earthquakes in East Antarctica outline potential 'rifts' adjacent to the Gamburtsev Subglacial Mountains", SCAR XXXIV Open Science Conference, Kuala Lumpur, Malaysia, August 22-26, 2016.
 - "Locations and focal mechanisms of deep long period events beneath Aleutian Arc volcanoes using back projection methods", American Geophysical Union Fall Meeting 2015, San Francisco, CA, December 14-18, 2015.
 - "Waveform studies of strong cryoseismic sources near the top of the Antarctic ice sheet", American Geophysical Union Fall Meeting 2013, San Francisco, CA, December 9-13, 2013.
 - "Subglacial volcanic seismicity in Marie Byrd Land detected by the POLENET/ANET seismic deployment", American Geophysical Union Fall Meeting 2012, San Francisco, CA, December 3-7, 2012.
 - "Detection of tectonic, volcanic, and cryospheric seismic sources in Antarctica using POLENET seismic array and GSN seismic stations", Scientific Committee on Antarctic Research Open Science Conference 2012, Portland, OR, July 16-19, 2012.
 - "Detection of tectonic, volcanic, and cryospheric seismic sources in Antarctica using POLENET seismic array and GSN seismic stations", Seismological Society of America Annual Meeting 2012, San Diego, CA, April 17-19, 2012.
 - "Detection of seismic sources associated with ice movement in Antarctica using POLENET seismic array, AGAP seismic array, and GSN seismic stations", American Geophysical Union Fall Meeting 2011, San Francisco, CA, December 5-9, 2011.
 - "Detection of seismic sources associated with ice movement in Antarctica using the AGAP and POLENET seismic deployments", International Symposium on Antarctic Earth Science 2011, Edinburgh, Scotland, July 10-16, 2011.
 - "Detection of seismic sources associated with ice movement in Antarctica using the AGAP and POLENET seismic deployments", American Geophysical Union Fall Meeting 2010, San Francisco, CA, December 13-17, 2010
 - "Detection of long period sources associated with ice movement in Antarctica using the AGAP and POLENET seismic stations", International Polar Year Open Science Conference, Oslo, Norway, June 8-12, 2010.

■ Poster Abstracts (Student Authors)

- *McMahon, N. D., Aster, R.C., *Myers, E.K., and **Lough, A.C.** "Using subspace detection to study deep long-period seismicity beneath the Executive Committee Range, Marie Byrd Land, Antarctica." AGU Fall Meeting Abstracts. 2016.
- *Rasmussen, D.J., T.A. Plank, D.C. Roman, **A.C. Lough**, P.L. Stelling, R.J. Bodar, and E.H. Hauri. "Run-Up to the 1999 Sub-Plinian Eruption of Shishaldin Volcano Unveiled Using Petrologic and Seismic Approches." AGU Fall Meeting Abstracts. 2016
- Aster, R.C., *McMahon, N.D., *Myers, E.K., and **Lough, A.C.** "Deep Long-period Seismicity Beneath the Executive Committee Range, Marie Byrd Land, Antarctica, Studied Using Subspace Detection". In AGU Fall Meeting Abstracts, 2015.
- *Lloyd, A.J., Wiens, D., **Lough, A.C.**, Anandakrishnan, S., Nyblade, A., Aster, R.C., Huerta, A.U., and Winberry, J.P. "Prolific Sources of Icequakes: the Mulock and Skelton glaciers of Antarctica." AGU Fall Meeting, 2015.
- Myers, E.K., Aster, R.C., Benz, H., McMahon, N.D., McNamara, D.E., **Lough, A.C.**, Wiens, D.A. and Wilson, T.J., "Applications of Subspace Seismicity Detection in Antarctica." In *AGU Fall Meeting Abstracts*. 2014.
* Indicates Student Author

RESEARCH EXPERIENCE

- **Postdoctoral Fellow** 2014-2016
Department of Terrestrial Magnetism, Carnegie Institution of Washington Washington D.C.
 - Utilized AVO catalogs to characterize deep seismicity in the Aleutian Arc
 - Adapted Matlab codes to locate DLP (deep long period) sources with back projection
 - Continued dissertation work on new 'cryo-seismic' sources in Antarctica
 - Continued dissertation work on intraplate seismicity in East Antarctica
- **Graduate Research Assistant** 2007-2014
Department of Earth and Planetary Sciences, Washington University in St. Louis St. Louis, MO
 - Developed codes to detect and locate long period events
 - Created Antelope™ databases combing temporary array data and GSN permanent station data from IRIS DMC
 - Maintained and updated Antelope™ databases
 - Ran detection/location and relocation processes on Antelope™ databases
 - Performed relative relocation on localized event clusters
 - Generated dispersion curves by running multiple-filter analysis
 - Generated synthetic seismograms using reflectivity methods
 - Trained younger students in Antelope™, SAC, GMT, basic Linux/Unix commands and scripting languages
- **Research Assistant, Seismology Lab** May 2005-June 2007
Department of Geology, University of Missouri-Columbia Columbia, MO
 - Created GPS point coverage maps for ARC-GIS and input metadata information
 - Requested ASTER imagery and created DEM models from stereo-images
 - Scanned and geo-referenced collection of maps
 - Requested and processed GSN permanent station data from IRIS DMC
 - Updated firmware on university owned Nanometrics Taurus data acquisition systems
 - Prepared instruments (Nanometrics Trillium-120 and Taurus) and equipment for shipping to field deployment
 - Processed data from temporary seismic array
 - Measured shear-wave splitting for SKS, SKKS, and local S phases

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AWARDS & FUNDING

- NSF proposal revised and resubmitted: 2017
Geophysical study of subglacial volcanism in Marie Byrd Land
- Asked to co-convene session on Antarctic Volcanism at SCAR Open Science Conference 2016
- NSF proposal revised and resubmitted: 2015
Geophysical study of subglacial volcanism in Marie Byrd Land
- NSF proposal submitted: Geophysical study of subglacial volcanism in Marie Byrd Land 2014
- NSF travel award to SCAR Open Science Conference, Auckland, New Zealand August 2014
- NSF travel award to SCAR Open Science Conference, Portland July 2012
- Outstanding Student Presentation, Seismological Society of America Annual Meeting April 2012
- NSF travel award to SCAR International Earth Science Symposium, Edinburgh July 2011
- APECS Travel Award to International Polar Year OSC, Oslo, Norway June 2010
- Toleman Fellowship, Washington University in St. Louis August 2007-May 2009
- Clayton & Louise Johnson Field Course Scholar, University of Missouri-Columbia June 2007-July 2007
- Top Undergraduate to Attend Field Camp, University of Missouri-Columbia May 2007
- Phi Beta Kappa, invitation to join as Junior (only top 10 in College of Arts and Science) University of Missouri-Columbia April 2006
- Geology Development Board Outstanding Undergraduate Student Award (inaugural) University of Missouri-Columbia August 2005-May 2006
- Edmond & Mary Raymond Scholarship, University of Missouri-Columbia August 2006-May 2007
- College Research Mentor Program, University of Missouri-Columbia June 2006-August 2006
- G.E. Huggins Undergraduate Scholarship, University of Missouri-Columbia August 2005-May 2006
- Pearl Sando Scholarship in Geology, University of Missouri-Columbia August 2005-May 2006
- George Mahan Prize, University of Missouri-Columbia December 2003
- Emma Jean Ballew Agriculture Scholarship, University of Missouri-Columbia August 2003-May 2005
- Curators Scholar Award, University of Missouri-Columbia August 2003-May 2007
- Bright Flight Scholarship, University of Missouri-Columbia August 2003-May 2007

PROFESSIONAL MEMBERSHIPS

- Seismological Society of America (SSA) Joined 2011
- Association of Women Geoscientists (AWG) Joined 2011
- American Geophysical Union (AGU) Joined 2008
- Geological Society of America (GSA) Joined 2007

HONOR SOCIETIES

- **Phi Beta Kappa** April 2006
Invited to join as a Junior, only top 10 Juniors in the College of Arts and Science are invited each year.

TEACHING EXPERIENCE

- **Professor, Undergraduate Course-Geophysics GEO411** Spring Term 2017-2018
Department of Biodiversity, Earth, and Environmental Science, Drexel University Philadelphia, PA
- **Professor, Undergraduate Course-Structural Geology GEO325** Winter Term 2017-2018
Department of Biodiversity, Earth, and Environmental Science, Drexel University Philadelphia, PA

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- **Professor, Undergraduate Course-Geophysics GEO411** Winter Term 2016-2017
Department of Biodiversity, Earth, and Environmental Science, Drexel University Philadelphia, PA
- **Teaching Assistant, Undergraduate Course-Energy and the Environment** January 2011-May 2011
Department of Earth and Planetary Sciences, Washington University in St. Louis St. Louis, MO
- **Teaching Assistant, Undergraduate Course-Earth and the Environment** January 2010-May 2010
Department of Earth and Planetary Sciences, Washington University in St. Louis January 2009-May 2009
- **Teaching Assistant, Undergraduate Course-Principles of Geology** January 2007-May 2007
Department of Geology, University of Missouri-Columbia Columbia, MO

FIELD EXPERIENCE

- **Bioko Island, Equatorial Guinea, Africa** Fall 2017-Present
 - Designed seismic survey to study volcanic island in Cameroon Volcanic Line
 - First field season (Fall 2017) installed 4 stations
 - Second field season (Fall 2018) will service stations and install 4-6 new stations
- **Aleutian Islands, Alaska** August 2015, 2016
 - Member of interdisciplinary team to deploy 12 seismometers and collect samples on Aleutian volcanoes
 - Helped run huddle tests on seismic and infrasound equipment
 - Prepared seismic equipment for transport and organized for deployment
 - Leader of two-man team to install seismic and seismic/infrasound stations
 - Acted as assistant for colleagues collecting petrological and gas/water samples
 - Anticipated to return in August 2016 to remove seismic equipment and potentially help collect additional samples
 - Data collected during this project will be used to determine the seismicity of Mt. Cleveland (limited AVO instrumentation), especially the presence/absence of DLP (deep long period) events
- **Antarctica (South Pole and Antarctic Plateau)** 2008-2011
 - Member of team assigned to AGAP December 2008-January 2009
 - Member of team assigned to AGAP December 2009-January 2010
 - Member of team assigned to South Pole December 2010-January 2011
 - Prepared equipment for shipment from McMurdo station to field camp or South Pole
 - Prepared special cold weather instrument boxes for deployment
 - Performed huddle tests on cold-weather instruments prior to deployment
 - Tested lead-acid and lithium battery packs before deployment
 - Tested and prepared equipment for services runs
 - Flew with team to deploy, service, and remove instruments across Antarctic Plateau
 - Prepared instruments for shipment to new field sites
 - Prepared and packed used lithium battery packs for shipment to disposal
 - Prepared and packed used equipment for return shipment and disposal
 - Helped organize data into Antelope™ database
 - Reviewed incoming data for quality check
- **Isparta, Turkey** August 2007, 2006

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- Trained local collaborators in use of Nanometrics Taurus and Trillium-120 equipment
- Performed huddle tests on Nanometrics instruments and 4 PASSCAL instruments
- Member of one of two install teams in 2006
- Scouted locations and helped prepare vault pads
- Responsible for setting up Taurus system and ensuring functioning properly during install
- Participated in several service runs in 2006 to check newly installed stations
- Member of single removal team in 2007
- Removed equipment, cleaned, and prepared for return shipping to PASSCAL (2007)
- Responsible for reimbursing local collaborators for expenses incurred over the experiment

TECHNICAL SKILLS AND EXPERTISE

▪ Equipment

- Testing both temperate (normal) and cold-weather seismometers (Trillium Compact, 120, 240 and Guralp 3T) and data acquisition systems (Taurus, Ref-tec, Quantera Q-330)
- Installing, servicing, and removing both temperate and cold-weather stations
- Experience with variety of equipment combinations (Ref-tec/Trillium Compact, Taurus/Trillium-120, Ref-tec/Guralp-3T, Q-330/Trillium-T240, and Q-330/Guralp-3T cold-weather)
- Setting up data acquisition parameters on several data acquisition systems (Taurus, Ref-tec, Q-330)
- Updating firmware on Taurus systems

▪ Computer Skills

- Experienced on both Linux and Unix systems
- Various scripting languages (C-shell, bash shells, TC-shells, and perl scripts)
- Seismic Analysis Code (SAC)
- GSAC (St. Louis University equivalent to SAC)
- Antelope™ (generating, maintaining, and manipulating databases, viewing data, locating earthquakes, magnitude calculation, extracting data)
- Writing and editing programs in Fortran
- Various PASSCAL programs (PQL, rdseed, TauP)
- Generic Mapping Tools (GMT)
- ARC-GIS
- Adobe Illustrator and Photoshop
- Matlab
- Microsoft Office and Open Office/Libre office suite

UNIVERSITY SERVICE (Drexel University, Philadelphia, PA)

- Member Residential Life Student Conduct Board 2017-present

DEPARTMENTAL SERVICE (Drexel University, Philadelphia, PA)

- Faculty advisor for BGSA (Biology/BEES Graduate Student Association) 2017-present
- Geoscience Curriculum Committee 2016-present

DEPARTMENTAL SERVICE (Washington University, St. Louis, MO)

- Served as departmental Peer Mentors President (program connecting younger graduate students with older student mentors) 2011-2012

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- Organized OGRES practice talks 2010-2012
(Ongoing Graduate Research, program for graduate students to give practice talks with peer audience)
- Geology club treasurer 2008-2013
(managed club funds and ran a fundraising snack shop)
- Student representative to Graduate Recruitment Committee 2008-2011
(organized graduate student involvement during prospective graduate student visits including hosting, meals, city tours, and other entertainment)

COMMUNITY OUTREACH (St. Louis, MO)

- Presentation on Life in Antarctica to gifted first graders Spring 2013
- Aided with logistics for Women in Science Day Fall 2010
(Female high school students from inner city schools)
- Presentation on Field Work in Antarctica to middle school students Spring 2009
- Presentation on Seismology in the Real World for Women in Science Day Fall 2009, Fall 2008
(Female high school students from inner city schools)
- Demonstration of Seismology to local Boy Scout troops Fall 2008

REFERENCES

- Dr. Diana Roman, Staff Scientist
Department of Terrestrial Magnetism
Carnegie Institution for Science
5241 Broad Branch Road, NW
Washington, D.C. 20015-1305
202-478-8834
droman@dtm.ciw.edu
Relationship: Postdoctoral mentor
- Dr. Douglas Wiens, Professor
Department of Earth and Planetary Sciences
Washington University in St. Louis
Campus Box 1169, Rudolph Hall, Room 110
1 Brookings Drive
St. Louis, MO 63130-4899
314-935-6517
doug@wustl.edu
Relationship: Ph.D. advisor for 7 years, professor, and dissertation committee chair
- Dr. Richard Aster, Professor and Department Head
Department of Geosciences
Colorado State University
1482 Campus Deliver
Fort Collins, CO 80523
970-491-7606
Rick.Aster@colostate.edu
Relationship: Advisor on POLENET project for 4 years
- Dr. Michael Wyession, Associate Professor
Department of Earth and Planetary Sciences
Washington University in St. Louis
Campus Box 1169, Rudolph Hall, Room 110
1 Brookings Drive
St. Louis, MO 63130-4899
314-935-5625
michael@seismo.wustl.edu
Relationship: Teaching assistant advisor (Energy and the Environment), professor, dissertation committee member
- Dr. John Power, AVO Scientist-In-Charge/Supervising Geophysicist
Alaska Volcano Observatory
4210 University Drive
Anchorage, AK 99508-4626
907-786-7426
jpower@usgs.gov
Relationship: Fellow team member for field work on the Aleutian Islands, Alaska