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Research Interests

I am interested in the intersection of geoscientific questions, data science techniques and interactive computing. Questions that cross disciplinary lines and include multiple data-types (e.g. geophysical, geologic, hydrologic and petrophysical) are of particular interest to me. As a mechanism to facilitate collaboration between researchers in different disciplines, I contribute to open-source scientific software and open educational resources. My background is in geophysical simulations and inversions.

Current Projects

- Interactive, high-performance computing for geophysical simulations and inversions using Jupyter on the National Energy Research Scientific Computing Center (NERSC)
- Electromagnetic geophysical methods in settings with large contrasts in electrical and magnetic physical properties
- Exploring the principled application of machine learning tools to problems constrained by physical models
- Open source software for simulations and parameter estimation in geophysics

Education

2012 – 2018 **PhD** in Geophysics, University of British Columbia
Thesis: Electromagnetic imaging for subsurface injections
Advisor: Douglas Oldenburg
Themes: inverse problems, numerical simulations, electromagnetics

2008 – 2012 **BSc** with Honors in Geophysics, University of Alberta
First Class Honors

Appointments

Nov. 2018 – present **Postdoctoral Researcher**, Department of Statistics, University of California, Berkeley
Advisor: Fernando Pérez
Themes: Machine learning in the physical sciences, interactive computing, statistical techniques for geoscience

Professional Experience

Apr. 2016 – Sep. 2017 **Aranz Geo Canada Limited** (Calgary, AB)
Computational Geophysics Consultant (part-time)

Nov. 2015 – Apr. 2016 **3point Science Inc** (Calgary, AB)
Computational Geophysicist (part-time)

Jun. 2014 – Aug. 2014 **Schlumberger Doll Research** (Boston, MA)
Geophysics Intern

Jun. 2013 – Aug. 2013 **Schlumberger Electromagnetic Imaging** (Richmond, CA)
Geophysics Intern

May 2012 – Aug. 2012 **ConocoPhillips Canada** (Calgary, AB)
Geophysics Summer Student

May 2011 – Aug. 2011 **Alfred Wegener Institute of Polar and Marine Research** (Bremerhaven, Germany)
Geophysics Summer Student

Leadership in Open Science

Project co-creator: SimPEG

SimPEG is an open-source software project for simulation and parameter estimation in geophysics (simpeg.xyz) that was founded by Rowan Cockett, myself, and Seogi Kang. I continue to serve in a leadership role with the development, maintenance, and community support of the project. I review suggested changes to the code, advise on new developments, respond to issues, and lead weekly team meetings that discuss research and software development. Beyond research publications that include the founding team, SimPEG has been used in at least 6 peer-reviewed publications, 8 conference proceedings, 1 thesis at the Colorado School of Mines, and 3 in-progress theses at the University of British Columbia.

Project co-creator: GeoSci.xyz

In 2013, myself, Douglas Oldenburg, and Rowan Cockett started the GeoSci.xyz project. It is a collection of open-source web-based textbooks, including "Geophysics for Practicing Geoscientists (GPG)" (https://gpg.geosci.xyz) and "Electromagnetic Geophysics" (https://em.geosci.xyz), as well as a collection of interactive Jupyter notebooks for education (https://github.com/geoscixyz/geosci-labs). I continue to serve as a content editor; I help outline content to be created and review updates and new submissions. GeoSci.xyz resources are used as course material in at least 5 different universities and have been viewed by more than 160,000 users worldwide.

Open science community development and best practices

I am an editor with the Journal of Open Source Software (JOSS) where I facilitate peer-review of scientific software contributions and I have co-taught workshops on best practices in open source software development at the AGU annual meeting. In the broader open-source community, I participate in Project Jupyter, an open-source project for interactive computing. I have attended annual team meetings since 2017 and contribute to resources on the use of Jupyter in education[1].

[1] https://jupyter4edu.github.io/jupyter-edu-book

Metrics of Broad Impact

My scientific career, by nature of investing significant effort in the creation of open tools for geophysics which are used internationally by researchers, industry professionals, and educators, has a different impact profile that that of a researcher whose main output is purely publication-based. Here, I outline a few metrics of this broader impact.

SimPEG user base: The SimPEG slack community has over 180 members, which represents the most committed and engaged SimPEG users. The full user base is likely much larger but this is difficult to quantify because of the open-source nature of the code.

Institutions and companies using SimPEG: Below is a sampling of some universities, national labs, geologic surveys and companies where SimPEG is being used. Where applicable, I have also included example publications where SimPEG is used.

- **Colorado School of Mines**: The DC resistivity and electromagnetic simulation and inversion are used by researchers in the Center for Gravity, Electrical, and Magnetic Studies (CGEM). For example, Paré & Li (2017) examine the impact of different regularization choices in a DC resistivity inversion and Maag-Capriotti & Li (2018) use the induced polarization simulation in a methodology study (doi: 10.1190/segam2017-17739005.1, doi: 10.1190/segam2018-2998500.1).
- **Dias Geophysical**: The DC resistivity and induced polarization codes are used to invert field data acquired by Dias in 3D.
- **Geologic Survey of New Zealand**: The potential fields codes (gravity, magnetics, self-potential) have been used in volcanology studies (Miller et al., 2017; Miller et al., 2018), doi: 10.1016/j.epsl.2016.11.007, doi: 10.1029/2018GL078780
- **Lawrence Berkeley National Laboratory**: The electromagnetic simulations are used by researchers in the geophysics group to simulate how currents behave in settings with steel-cased wells (Wilt et al., 2018) doi: 10.1190/segam2018-2983425.1
- **Rural Research Institute, Korea**: The DC resistivity code has been used for Dam integrity monitoring applications (Lim, 2017) doi: 10.7582/GGE.2018.21.1.008.
- **University of British Columbia**: Many of the researchers in Geophysical Inversion Facility contribute to the code-base and use it daily as a part of their research. For example, Abediab et al. (2018) invert magnetic data in a tectonic study; Astic & Oldenburg (2017) develop an inversion approach which incorporates petrophysical information; and Kang et al. (2017) invert airborne electromagnetic data for electrical conductivity and chargeability. doi: 10.1016/j.tecto.2017.10.012, doi: 10.1190/segam2018-2995155.1, doi: 10.1190/INT-2016-0141.1

Universities using GeoSci.xyz: Below, I provide a sampling of courses where GeoSci.xyz resources are a significant component of the course material.

- **Fresno State**: The GPG was used in EES 118/250T: Applied Geophysics in 2017
- **Southern University of Science and Technology (China)**: The GPG is used in ESS302: Applied Geophysics II (Gravity, Magnetic, Electrical and Well Logging)
- **University of Alabama**: The GPG is used in GEO 369: Introduction Geophysics,
- **University of British Columbia**: The GPG is used in EOSC 350: Environmental, Geotechnical, and Exploration Geophysics I
- **University of Houston**: EM GeoSci is used in GEOL 4397-03: Electromagnetic Methods for Exploration

Society of Exploration Geophysics Distinguished Instructor Short Course: EM GeoSci was the primary resource for the 2017 SEG DISC course on "Geophysical Electromagnetics: Fundamentals and Applications," led by Douglas Oldenburg and co-instructed with myself and Seogi Kang. The course ran in 25 locations worldwide with ∼40 participants at each location.

GeoSci.xyz web-traffic: We began tracking metrics of use in April, 2016 using Google Analytics. The values below indicate views and new users since then.

- **Geophysics for Practicing Geoscientists (GPG)**: over 400,000 page-views and 80,000 users
- **Electromagnetic Geophysics**: over 440,000 page-views and 160,000 users

Funding & Grants

Awarded

2019 **Senior Personnel**: NSF - EarthCube Data Capabilities: Collaborative Proposal: Jupyter meets the Earth: Enabling discovery in geoscience through interactive computing at scale ($\sim \$1,960,000$)
PIs: Fernando Pérez (UC Berkeley), Laurel Larsen (UC Berkeley), Joe Hamman (NCAR)

2019 **Senior Personnel**: Geoscientists Without Borders ($\$50,000$)
Improving Water Security in Mon State, Myanmar via Geophysical Capacity Building
PI: Douglas Oldenburg (UBC)

Completed

2014 **Co-PI**: Science Center for Learning and Teaching - Development Grant ($\$2,500$)
For development of online interactive resources for undergraduate geophysics at the University of British Columbia
PI: Douglas Oldenburg (UBC)

Software and Open Science

I contribute to a number of open-source software projects, all of which are accessible through my GitHub profile (https://github.com/lheagy). Some of the larger projects include:

2014 – present **GeoSci.xyz**
Core maintainer and contributor to online interactive textbooks for geophysics. Resources include:

- **Geophysics for Practicing Geoscientists:** an introductory resource on applied geophysics (http://gpg.geosci.xyz)
- **Electromagnetic Geophysics:** a graduate level resource on the theory and application of electromagnetic geophysical methods (http://em.geosci.xyz)
- **GeoSci Labs:** a collection of Jupyter notebooks for exploring concepts in geophysics (https://github.com/geoscixyz/geosci-labs)

2014 – present **SimPEG**
Core maintainer and community developer. Software repositories include:

- **SimPEG:** software for numerical simulations and inversions in geophysics (https://github.com/simpeg/simpeg)
- **discretize:** meshing and discretization tools for finite volume and inverse problems (https://github.com/simpeg/discretize)
- **geoana:** analytic solutions for common physics problems relevant to geophysics (https://github.com/simpeg/geoana)

Teaching

Undergraduate

2013 – 2016 **Teaching Assistant:** EOSC 350: Environmental, Geotechnical, and Exploration Geophysics
University of British Columbia
Instructor: Douglas Oldenburg

2015 **Teaching Assistant:** Directed Studies: Inversion in Applied Geophysics
University of British Columbia
Instructor: Douglas Oldenburg

2012 **Teaching Assistant:** EOSC 354: Analysis of Time Series and Inverse Theory for Earth Scientists
University of British Columbia
Instructor: Michael Bostock

Workshops & Short Courses

2019 **Co-Instructor:** Deterministic inversion
LAPIS 2019: La Plata International School on Astronomy and Geophysics
Lead Instructor: Douglas Oldenburg, Co-Instructor: Seogi Kang
(https://courses.geosci.xyz/lapis2019)

2018 **Co-Instructor:** Best Practices for Modern Open-Source Research Codes
AGU Fall Meeting 2018 in Washington, DC
Co-Instructors: Leonardo Uieda, Lion Krischer and Florian Wagner
(https://github.com/agu-ossi/2018-agu-oss)

2018 **Co-Instructor:** 3D EM Modelling and Inversion with Open Source Resources
AEM 2018: 7th International Workshop on Airborne Electromagnetics in Kolding, Denmark
(https://courses.geosci.xyz/aem2018)

2017 **Co-Instructor:** Geophysical Electromagnetics: Fundamentals and Applications
Society of Exploration Geophysics Distinguished Instructor Short Course
Lead instructor: Douglas Oldenburg, Co-Instructor: Seogi Kang
(http://disc2017.geosci.xyz)

- Locations:
  - Denver, USA (January 30-31, 2017)
  - Perth, Australia (July 27-28, 2017)
  - Adelaide, Australia (August 2-3, 2017)
  - Brisbane, Austraila (August 7-8, 2017)
  - Delft, Netherlands (September 11-12, 2017)
  - Bonn, Germany (September 18-19, 2017)
  - Vienna, Austria (September 21-22, 2017)
  - Zurich, Switzerland (September 26-27, 2017)
  - Aarhus, Denmark (October 2-3, 2017)
  - Toronto, Canada (October 27, 2017)
  - Mexico City, Mexico (November 6-7, 2017)
  - Buenos Aires, Argentina (November 13-14, 2017)
  - Santiago, Chile (November 16-17, 2017)
  - Santa Cruz de la Sierra, Bolivia (November 22-23, 2017) - Cancelled
  - Rio de Janeiro, Brazil (November 28-29, 2017)
  - Calgary, Canada (December 5-6, 2017)
  - Vancouver, Canada (December 12-13, 2017)

2016 **Organizer:** Geophysical Simulation and Inversion (August 19-21, 2016)
Banff International Research Station,
Organized with Douglas Oldenburg, Adam Pidlisecky and Rowan Cockett
(http://www.birs.ca/events/2016/2-day-workshops/16w2695)

Service

Editorial

2017 – 2019 **Editor:** Journal of Open Source Software
Topics: Geoscience, geophysics (http://joss.theoj.org/about)

Conferences

2019 **Chair**: SciPy Birds of a Feather (BoF) Sessions
SciPy Conference (https://www.scipy2019.scipy.org/bof-sessions)

2018 **Town Hall Organizer**: Community Forum: The role of an open-source software initiative within the AGU
American Geophysical Union (AGU) Annual Meeting
Co-organized with: Lion Krischer, Leonardo Uieda

Session Convener: Short Talks: A tour of open-source software packages for the geosciences
American Geophysical Union (AGU) Annual Meeting
Co-organized with Florian Wagner, Jens Klump and Lion Krischer

2017 **Panel Discussion Organizer:** Open Source Software in the Geosciences
American Geophysical Union (AGU) Annual Meeting

Co-organized with Anna Kelbert, Luz Andelica Caudillo Mata, Jared Peacock, Suzan van der Lee, Juan Lorenzo
(https://youtu.be/0GO4ZZ5Ry6M))

Program Committee Member: JupyterCon, August 22-25, New York, NY
(https://conferences.oreilly.com/jupyter/jup-ny)

Mentoring

2014 – 2015 **Undergraduate Research Mentor** Research Experience Program at the University of British Columbia
Student: Mohamed Rassas
Project: A comparison of conventional and open channel hydraulic fracturing and the importance of imaging to optimize the fracturing process, presented at *the Multidisciplinary Undergraduate Research Conference at the University of British Columbia*

Reviewing

American Geophysical Union (AGU) book proposal
Computers & Geosciences
Exploration Geophysics
Geophysical Journal International (GJI)
The Leading Edge
Society of Exploration Geophysics Abstracts

Awards

2019 **Gerald W. Hohmann Career Achievement Award**: outstanding junior scientist
Awarded for early-career scientists who have made outstanding contributions to electrical and electromagnetic geophysics. ($2,500)

2016 **UBC Library: Innovative Dissemination of Research Award**
Awarded for the SimPEG framework and community development. With Rowan Cockett and Seogi Kang. ($1,000)

2014 – 2017 **NSERC Vanier Scholarship**
Vanier Scholars demonstrate leadership skills and a high standard of scholarly achievement in graduate studies in the social sciences and/or humanities, natural sciences and/or engineering and health. The Vanier Scholarship is the top graduate scholarship in Canada. ($50,000 $\times$ 3)

2014 – 2017 **Alexander Graham Bell Canada Graduate Scholarship**
Awarded to high caliber scholars who are engaged in a doctoral program in the natural sciences or engineering ($35,000 $\times$ 3, declined)

2014 – 2018 **Four Year Fellowship (FYF) for PhD Students**
Selection based on academic excellence, upon the recommendation of the graduate program at UBC ($18,000 $\times$ 4, declined 3/4)

2013 **Special UBC Graduate Scholarship - W.H. Mathews Scholarship**
Awarded for academic achievement in Earth, Ocean and Atmospheric Sciences at UBC ($5,000)

2012 **Governor General's Silver Medal**
Awarded annually to the three undergraduate students (institution-wide) who achieve the highest academic standing overall upon graduation from his/her Bachelor degree program.

2012 **Lieutenant-Governor's Gold Medal**
Awarded to the convocating student from an Honours program in the Faculty of Science who has shown the highest distinction in scholarship (University of Alberta)

2012 **APEGGA Past Presidents' Medal in Geophysics**
Awarded to the convocating student who is a Canadian Citizen or Permanent Resident with the highest academic standing in a specialization or honours program in Geophysics on the basis of the final year

2011 **The APEGGA Scholarship in Geophysics**
Awarded on the basis of superior academic achievement in Honors Geophysics or Specialization in Geophysics ($\$3,000 \times 2$)

2010 – 2012 **The David K Robertson Award in Geophysics and Geology**
Awarded to a student entering the third year of a BSc Specializing in Geology or Geophysics on the basis of passion and talent in their field of study, demonstrated leadership, participation in extracurricular activities, and academic standing. ($\$5,000 \times 2$)

2010 – 2012 **The Encana Geology and Geophysics Scholarship**
Awarded to student(s) with superior academic achievement entering the third or fourth year of study for a Bachelor of Science with a major in Geology or Geophysical Sciences. ($\$3,500 \times 2$)

2009 – 2011 **Louise McKinney Post Secondary Scholarship, Government of Alberta**
Recognizes students for their academic achievements at a provincial level and encourages them to continue in their undergraduate program of study ($\$2,500 \times 3$)

2009 **Pearl Cuthbertson Memorial Award**
Awarded to a student entering the second year of study for a Bachelor of Science degree who has completed Science 100. Selection based on academic standing and demonstrated determination, curiosity and enthusiasm for science. ($\$2,000 \times 2$)

2009 **Pearson Book Prize**
Awarded for academic achievement in Writing Studies in Science 100

2008 – 2012 **Dean's Honor Roll, University of Alberta**
Awarded for academic achievement ($\times 4$)

Publications

Peer Reviewed Publications (submitted or in review)

2019 **(in review)** Fournier, D., **Heagy, L. J.** & Oldenburg, D. W., 2019. Sparse magnetic vector inversion in spherical coordinates: Application to the Kevitsa Ni-Cu-PGE magnetic anomaly, Finland. *Geophysics*

(in press) Kang, S., Oldenburg, D. W. & **Heagy, L. J.** & 2019. Detecting induced polarization effects in time-domain data: a modeling study using stretched exponentials. *Exploration Geophysics*.

Peer Reviewed Publications

2019 **Heagy, L. J.**, Kang, S., Cockett, R. & Oldenburg, D. W., 2019. Open source software for simulations and inversions of airborne electromagnetic data. *Exploration Geophysics*. doi: 10.1080/08123985.2019.1583538. arXiv: 1902.08238

Heagy, L. J. & Oldenburg, D. W., 2019. Modeling electromagnetics on cylindrical meshes with applications to steel-cased wells. *Computers & Geosciences*. doi: 10.1016/j.cageo.2018.11.010. arXiv: 1804.07991

Heagy, L. J. & Oldenburg, D. W., 2019. Direct current resistivity with steel-cased wells. *Geophysical Journal International* doi: 10.1093/gji/ggz281. arXiv: 1810.12446

2018 Cockett, R., **Heagy, L. J.** & Haber, E., 2018. Efficient 3D inversions using the Richards equation. *Computers & Geosciences*. doi: 10.1016/j.cageo.2018.04.006

2017 **Heagy, L. J.**, Cockett, R., Kang, S., Rosenkjaer, G. K., & Oldenburg, D. W., 2017. A framework for simulation and inversion in electromagnetics. *Computers & Geosciences*. doi: 10.1016/j.cageo.2017.06.018

2016 Caudillo-Mata, L. A., Haber, E., **Heagy, L. J.** & Schwarzbach, C., 2016. A framework for the upscaling of the electrical conductivity in the quasi-static Maxwell's equations. *Journal of Computational and Applied Mathematics*. doi: 10.1016/j.cam.2016.11.051

2015 Cockett, R., Kang, S., **Heagy, L. J.**, Pidlisecky, A. & Oldenburg, D. W., 2015. SimPEG: An open source framework for simulation and gradient based parameter estimation in geophysical applications. *Computers & Geosciences*. doi: 10.1016/j.cageo.2015.09.015

Non Peer Reviewed Publications

2018 Barba, L. A., Barker, L. J., Blank, D. S., Brown, J., Downey, A. B., George, T., **Heagy, L. J.**, Mandli, K. T., Moore, J. K., Lippert, D., Niemeyer, K. E., Watkins, R. R., West, R. H., Wickes, E., Willing, C., & Zingale M., 2018. Teaching and Learning with Jupyter. (https://jupyter4edu.github.io/jupyter-edu-book/)

2017 Kang, S., **Heagy, L. J.**, Cockett, R., & Oldenburg, D. W., 2017. Exploring nonlinear inversions: A 1D magnetotelluric example. *The Leading Edge*. doi: 10.1190/tle36080696.1

2016 Cockett, R., **Heagy, L. J.** & Oldenburg D. W., 2016. Pixels and their neighbors: Finite volume. *The Leading Edge*. doi: 10.1190/tle35080703.1

Patents

2014 Wilt, M., Cuevas, N., & **Heagy L. J.**, 2014. Determining proppant and fluid distribution. *US Patent App. 14/494,313*

Presentations

(† : award)

Keynote or Invited

2019 [upcoming] **Heagy, L. J.** 2019. Pangeo Annual meeting

[upcoming] **Heagy, L. J.** 2019. Keynote: 7th Latin American Conference for Scientific Python.

[upcoming] **Heagy, L. J.** 2019. Colorado School of Mines Heiland Lecture

Heagy, L. J. & Oldenburg, D. W., 2019. Exploring the Physics of Electromagnetics with Steel-Cased Wells Using Open-Source Tools. *International Union of Geodesy and Geophysics (IUGG) 2019*

Heagy, L. J., 2019. Sharing Reproducible Computations on Binder. *Symposium on Data Science and Statistics (SDSS) 2019*

Heagy, L. J., Cockett, R., & Oldenburg, D. W., 2016. GeoSci: practices to collaboratively build online resources for geophysics education. *AGU Fall Meeting*

Heagy, L. J. & Oldenburg, D. W., 2016. Examining the impact of steel cased wells on electromagnetic signals. *AGU Fall Meeting*

2014 **Heagy, L. J.** & Oldenburg, D. W., 2014. Using electromagnetics to delineate proppant distribution in a hydraulically fractured reservoir. *SEG Development and Production Forum, Santa Rosa CA*.

Other Presentations

2018 **Heagy, L. J.**, Kang, S., Cockett, R., & Oldenburg, D. W., 2018. Open source software for simulations and inversions of airborne electromagnetic data. *AEM 2018: 7th International Workshop on Airborne Electromagnetics*

2017 **Heagy, L. J.**, Cockett, R. & Oldenburg, D. W., 2017. Modular electromagnetic simulations with applications to steel cased wells. *6th International Symposium on Three-Dimensional Electromagnetics*.

Heagy, L. J. & Cockett, R., 2017. Deploying a reproducible course. *JupyterCon 2017*. youtube: https://youtu.be/XY3Tq9Wd1_A

Heagy, L. J. & Cockett, R., 2017. Interactive Geophysics. *SciPy Conference*. youtube: https://youtu.be/NuUe2ja5LCE

Heagy L. J., Fournier, D., Kang, S. & Miller, C., 2017. Simulation and parameter estimation in geophysics. *British Columbia Geophysical Society Meeting*

2016 **Heagy, L. J.,**, Using open source tools to refactor geoscience education. *SciPy Conference*. youtube: https://youtu.be/IW2LDsevvDk

Kang, S., Cockett, R., **Heagy, L. J.** and Oldenburg, D. W., 2016. Practices to enable the geophysical research spectrum: from fundamentals to applications. *AGU Fall Meeting*

Yang, D., Oldenburg, D. W. & **Heagy, L. J.**, 2016. 3D DC resistivity modeling of steel casing for reservoir monitoring using equivalent resistor network. *SEG Annual Meeting*. doi: 10.1190/segam2016-13868475.1

2015 Cockett, R., **Heagy, L. J.**, Kang, S. & Rosenkjaer, G. K., 2015. Development practices and lessons learned in developing SimPEG. *AGU Fall Meeting*

Heagy, L. J., 2015. Using Python to Span the Gap between Education, Research, and Industry Applications in Geophysics. *SciPy Conference*. youtube: https://youtu.be/4msHJMBvzaI

Heagy, L. J., Cockett, R., Kang, S., Rosenkjaer, G. K. & Oldenburg, D. W., 2015. simpegEM: An open-source resource for simulation and parameter estimation problems in electromagnetic geophysics. *AGU Fall Meeting*

Heagy, L. J., Cockett, R., Kang, S. & Oldenburg, D. W., 2015. Real simulation tools in introductory courses: packaging and repurposing our research code. *AGU Fall Meeting*

Heagy, L. J., Cockett, R., Oldenburg, D. W. & Wilt, M., 2015. Modelling electromagnetic problems in the presence of cased wells. *SEG Annual Meeting*. doi: 10.1190/segam2015-5931035.1

Kang, S., Cockett, R., **Heagy, L. J.**, & Oldenburg, D. W., 2015. Moving between dimensions in electromagnetic inversions. *SEG Annual Meeting*. doi: 10.1190/segam2015-5930379.1

2014 Caudillo-Mata, L. A., Haber, E., **Heagy, L. J.**, & Oldenburg, D. W., 2014. Numerical upscaling of electrical conductivity: A problem specific approach to generate coarse-scale models. *SEG Annual Meeting*. doi: 10.1190/segam2014-1488.1

Devriese, S. G. R., Corcoran, N., Cowan, D., Davis, K., Bild-Enkin, D., Fournier, D., **Heagy, L. J.**, Kang, S., Marchant, D., McMillan, M. S., Mitchell, M., Rosenkjar, G. K., Yang, D. & Oldenburg, D. W., 2014. Magnetic inversion of three airborne data sets over the Tli Kwi Cho kimberlite complex. *SEG Annual Meeting*. doi: 10.1190/segam2014-1205.1

Fournier, D., **Heagy, L. J.**, Corcoran, N., Cowan, D., Devriese, S. G. R., Bild-Enkin, D., Davis, K., Kang, S., Marchant, D., McMillan, M. S., Mitchell, M., Rosenkjar, G. K., Yang, D., Oldenburg, D. W., 2014. Multi-EM systems inversion - Towards a common conductivity model for the Tli Kwi Cho complex. *SEG Annual Meeting*. doi: 10.1190/segam2014-1110.1

Fournier, D., **Heagy, L. J.**, Corcoran, N., Cowan, D., Devriese, S. G. R., Bild-Enkin, D., Davis, K., Kang, S., Marchant, D., McMillan, M. S., Mitchell, M., Rosenkjar, G. K., Yang, D., Oldenburg, D. W., 2014. Multi-EM systems inversion - Towards a common conductivity model for the Tli Kwi Cho complex. *SEG Annual Meeting*. doi: 10.1190/segam2014-1110.1

Heagy, L. J., Cockett, R., & Oldenburg, D. W., 2014. Parametrized inversion framework for proppant volume in a hydraulically fractured reservoir. *SEG Annual Meeting*. doi: 10.1190/segam2014-1639.1

†**Heagy, L. J.**, Oldenburg, D. W. & Chen, J., 2014. Where does the proppant go? Examining the application of electromagnetic methods for hydraulic fracture characterization. *CSEG GeoConvention*
† Student Honourable Mention: Integrated Poster

Wilt, M., **Heagy, L. J.** & Chen, J., 2014. Hydrofracture Mapping and Monitoring with Borehole Electromagnetic (EM) Methods. *76th EAGE Conference and Exhibition*

2013 † **Heagy L. J.** & Oldenburg, D. W., 2013. Investigating the potential of using conductive or permeable proppant particles for hydraulic fracture characterization. *SEG Annual Meeting*. doi: 10.1190/segam2013-1372.1
† Award of Merit (Best Student Paper, Annual Meeting)

Media

2018 Guest on Episode 163: Python in Geoscience, May 25, 2018. *Talk Python to Me* by Michael Kennedy (https://talkpython.fm/)

2017 Guest on Episode 41, Apr. 24, 2017. *Undersampled Radio* by Graham Ganssle and Matt Hall (https://undersampledrad.io)

Guest on Episode 11, Jan. 24, 2017. *Seismic Soundoff* by the Society of Exploration Geophysicists (http://seg.org/podcast)

2012 Article: Science 100 pioneer grounded in geophysics. *University of Alberta Spring Convocation 2012: Celebrating Talented People* (https://www.ualberta.ca/news-and-events/newsarticles)