Caitlin Haedrich

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EDUCATION

North Carolina State University: PhD Student in Geospatial Analytics   2020 - Present

Dartmouth College: Non-degree seeking coursework in Physics   2019 - 2020

Middlebury College: B.A. in Mathematics and Geology   2013 - 2017

  Geology Thesis: *"LiDAR Ground Surface Classification in the Middlebury River Watershed" Advisor: Will Amidon.*

  Math Thesis*: "Rational Points on Elliptic Curves and Mordell's Theorem" Advisor: David Dorman.*

University of Otago, New Zealand   Spring 2015

EXPERIENCE

DELTA Exploratory Grant Recipient, Grant Author and co-PI, Sept. 2023 – Aug. 2024

Received grant for exploring the integration of coding through Jupyter Notebooks and grass.jupyter into a Master's level GIS course (GIS582). I also received a certification in **Quality Matters** in designing and evaluating online higher education courses.

Teaching Assistant, Center for Geospatial Analytics, Aug. 2021 – Dec. 2023

Help teach, grade, and develop assignments for two 700-level geospatial analytics courses (GIS710 and GIS714). Also led several conference workshops on related material.

Related Workshops and Presentations:

Petrasova, A., Haedrich, C., Petras, V. "Unlock the Power of GRASS GIS." *Workshop at FOSS4G NA (2023).*

Haedrich, C., Petrasova, A., & Mitasova, H. "Modeling vegetated stream buffer impacts on water depth and discharge at the watershed scale with GRASS GIS and Jupyter Notebooks". *Poster at AGU23 (December 2023).*

Andreo, V., Haedrich, C. "GRASS GIS 101: From GUI Clicks to Writing Scripts". *Workshop at the Tennessee Geographic Information Council's Annual Meeting (April 2024).*

Haedrich, C., Regmi, P. "Coastal evolution analysis and inundation modeling with GRASS GIS". *Workshop at the CSDMS Annual Meeting (May 2024).*

Instructor, OpenGeoHub Summer School, Aug. 2023

Instructed and co-authored a workshop at a week-long summer school in Poznan, Poland.

Related Workshop:

Petrasova, A., Haedrich, C. "Parallelization of geoprocessing workflows in GRASS GIS and Python". *Workshop at OpenGeoHub (2023).*

GRASS GIS Mini Grant Recipient, Jan. – Mar. 2022

Received grant for continued integration of GRASS GIS and Jupyter Notebooks through expansion of grass.jupyter package.

Related Publications, Presentations and Workshops:

Haedrich, C., Petras, V., Petrasova, A., Blumentrath, S., & Mitasova, H. (2023). "Integrating GRASS GIS and Jupyter Notebooks to

facilitate advanced geospatial modeling education". *Transactions in GIS.*

Haedrich, C., Petras, V., Petrasova, A. "Using GRASS GIS in Jupyter Notebooks: An Introduction to grass.jupyter". *Talk at FOSS4G (2022).*

Petrasova, A., Haedrich, C., Petras, V. "Unleash the power of GRASS GIS with Jupyter". *Workshop at FOSS4G (2022).*

Google Summer of Code, Student with GRASS GIS and OSGeo, Jun. – Aug. 2021

Contributed to GRASS GIS by improving the integration of GRASS GIS and Jupyter Notebooks. Wrote package grass.jupyter that contains classes and functions for launching GRASS GIS in Jupyter and rendering GRASS data in Notebooks.

Research Physical Scientist, Cold Regions Research & Engineering Laboratory, Feb 2018 – Jul 2020

Worked for US Army Corps of Engineers with Dr. Daniel Breton on radio frequency propagation in urban and mountainous environments. Conducted research on urban radio-frequency noise.

Related Publications:

Breton, D.J., Haedrich, C.E., Kamrath, M.J., Wilson, D.K. (2019). "Street-scale Mapping of Urban Radiofrequency Noise at VHF and UHF." *AGU Radio Science Journal.*

Breton, D.J., Haedrich, C.E., Hoch, G.R., Streeter, S.S., Maxson, M.L. (2020). "The Urban Ground-to-Ground Radio-Frequency Channel: Measurement and Modeling in the Ultrahigh Frequency Band." *ERDC/CRREL Technical Report 20-8.*

Haedrich, C. E., Breton, D. J. (2019). "Measuring Very High Frequency and Ultrahigh Frequency Radio Noise in Urban Environments: A Mobile Measurement System for Radio-Frequency Noise." *ERDC/CRREL Technical Report19-8.*

Related Conference Papers:

Breton, D.J., Haedrich, C.E. (2020). "Occluded Scatterers and the Urban Ground-to-ground Channel at Low UHF." *North American Radio Science Meeting and IEEE International Symposium on Antennas and Propagation.*

Haedrich, C.E., Breton, D.J. (2020). "Modeling RF Noise in Urban Environments with Spatially Distributed Point Sources." *North American Radio Science Meeting and IEEE International Symposium on Antennas and Propagation.*

Haedrich, C.E., Breton, D.J., Wilson, D.K. (2019). "Isarithmic mapping of radio-frequency noise in urban environments." *Proceedings of the Military Sensing Symposia on Battlespace Acoustic, Seismic, Magnetic and Electric-Field Sensing and Signatures.* San Diego, CA.

Haedrich, C.E., Breton, D.J., Wilson, D.K. (2018). "Preliminary measurements on the geography of urban VHF radio-frequency noise." *Proceedings of the Military Sensing Symposia on Battlespace Acoustic, Seismic, Magnetic and Electric-Field Sensing and Signatures.* Gaithersburg, MD.

Kamrath, M.J., Wilson, D.K., Hart, C.R., Breton, D.J., Haedrich, C.E. (2019). "Evaluating parametric probability density function for urban acoustic noise." *INTER-NOISE and NOISE-CON Congress and Conference Proceedings.*

Lang, R., Suer, C., Breton, D.J., Haedrich, C.E. (2019). "UHF Mountain Propagation: Measurements and Modeling." *USNC-URSI Radio Science Meeting.* Atlanta, GA.

Suer, C., Lang, R., Breton, D.J., Haedrich, C.E. (2020). "P and L Band Coherent Wave Propagation through a Tree Covered Mountainside." *North American Radio Science Meeting and IEEE International Symposium on Antennas and Propagation.*

Environmental Geophysics Intern, DoE Lawrence Berkeley National Laboratory, Jun 2017 – Dec 2017

Processed and analyzed multispectral and RGB (TrueColor) imagery collected by drone as part of the Watershed Function Scientific Focus Area (SFA) and Next Generation Ecosystem Experiments (NGEE-Arctic). Managed large datasets and worked with a team of scientists to parameterize hydrogeochemical processes in the critical zone.

Related Conference Papers:

Falco, N., Dafflon, B., Wainwright, H., Leger, E., Haedrich, C., Peterson, J., Hubbard, S. (2018). "Integrated imaging of above and below ground properties and their interactions: A case study in East River Watershed, Colorado." *In SEG Technical Program Expanded Abstracts 2018.*

Teton Science School AmeriCorps Field Education Intern, Summer 2016

Taught all ages the ecology, geology, and history of conservation in the Greater Yellowstone Ecosystem.

Undergraduate Research Assistant, Middlebury College, Aug 2015

Worked for Professor Will Amidon extracting river profiles and watershed information from the LiDAR data of the Middlebury and New Haven Rivers.