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Claire E. Ruggles

STRUCTURAL GEOLOGY AND GEOPHYSICS
PHD CANDIDATE

Objective

I am a PhD candidate at the University of Wisconsin – Madison using structural geology and geophysics to understand how magma is transported and stored in shallow volcanic systems. I am seeking to pursue a career in research where I can use these methods to locate potential sources for hazards and/or economic resources.

Education

University of Wisconsin – Madison 2021- Present
PhD Structural Geology and Geophysics
Expected Graduation: Summer 2025
Dissertation: "Direct and indirect observations of magma chambers using structural and geophysical methods"
Advisor: Dr. Basil Tikoff Distributed Minor in Statistics

Iowa State University 2018-2020
MS Structural Geology
Thesis: "A multiple-pulse emplacement model for the Shonkin Sag laccolith, MT"
Advisor: Dr. Sven Morgan and Dr. Jacqueline Reber

University of Wisconsin – Madison 2014-2018
BS Geology and Geophysics
Thesis: "Integrated fabric, U-Pb zircon ages, and zircon Hf data from the Hazard Creek complex, western Idaho"
Advisor: Dr. Basil Tikoff
Minors in Physics and German

Honors and Awards

GSA Geophysics & Geodynamics Division Best Student Presentation Award 2024
Geological Society of America

Thomas E. Berg Award for Excellence in Teaching 2022, 2023, 2024
University of Wisconsin – Madison, Department of Geosciences

UW Madison Graduate Student Research Grant 2023
University of Wisconsin – Madison

GSA Graduate Student Research Grant 2019, 2022
Geological Society of America

GSA Geophysics & Geodynamics Division Student Research Grant 2021
Geological Society of America

Departmental Funding 2021
University of Wisconsin – Madison, Department of Geosciences

Jack Kleinman Grant for Volcano Research 2021
The Community Foundation for Southwest Washington

John Lemish Memorial Scholarship 2020
Iowa State University, Department of Geological and Atmospheric Sciences

ExxonMobil/GSA Student Geoscience Grant 2019
ExxonMobil and the Geological Society of America

Outstanding Mention for GSA Graduate Student Research Grant 2019
Geological Society of America

Georgia and Carl Vondra Fellowship 2018
Iowa State University, Department of Geological and Atmospheric Sciences

Eugene Cameron Scholarship 2018
University of Wisconsin – Madison, Department of Geosciences

Field Camp Scholarship 2017
University of Wisconsin – Madison, Department of Geosciences

Thermo-Fisher STEM Scholarship 2014-2018
University of Wisconsin – Madison

Publications

C. E. Ruggles, S. Morgan, and J. E. Reber, 2021, A multiple-pulse emplacement model for the Shonkin Sag laccolith, Montana, USA. Journal of Structural Geology. 149. 2021

Presentations

C. E. Ruggles, C. Miller, B. Tikoff, and H. Le Mével, 2024, Mass flux and magma storage at the Laguna del Maule volcanic field: Magma reservoir evolution on human timescales. GSA Connects, Anaheim, Sept. 22-25. Poster. 2024

C. E. Ruggles, A. Flinders, and B. Tikoff, 2023, Imaging the structure of the summit region of Kilauea volcano through a high-resolution gravity survey. AGU Fall Meeting, San Francisco, Dec. 11-15. Talk. 2023

C. E. Ruggles, E. Watts, B. Schoene, and B. Tikoff, 2022, A multi-method approach to determining the emplacement history of the Duncan Hill pluton, WA: An analogue to modern magma emplacement in the North Cascades Arc. AGU Fall Meeting, Chicago, Dec. 12-16. Poster. 2022

C. E. Ruggles, S. Morgan, and J. Reber, 2021, An emplacement model for low-volume intrusions based on the Shonkin Sag laccolith, Montana. GSA Connects, Portland, Oct. 10-13. Talk. 2021

C. E. Ruggles, S. Morgan, and J. Reber, 2019, Pulses, folding and faulting: What can a structural perspective on the Shonkin Sag laccolith tell us about shallow magma emplacement? AGU Fall Meeting, San Francisco. Dec. 9-13. Poster. 2019

C. E. Ruggles, B. Tikoff, M. Patzke, K. Surpless, and J. Vervoort, 2018, Integrated fabric, U-Pb zircon ages, and zircon Hf data from the Hazard Creek complex, western Idaho. Joint Rocky Mountain/Cordilleran Annual Section Meeting, Flagstaff, May 15-17. Poster. 2018

Research Experience

PhD Dissertation University of Wisconsin – Madison Advisor: Dr. Basil Tikoff 2021-Present
- Using a combination of structural geology and geophysics to investigate shallow magma transport and storage
- Methods include gravimetry, structural analyses, and rock magnetism

Geology Internship, Hess Corporation Summer 2024
- Assessed prospectivity in the Gulf of Mexico
- Methods included seismic interpretation and rock physics analyses

MS Thesis Iowa State University 2018-2020
Advisor: Dr. Sven Morgan and Dr. Jacqueline Reber
- Investigated shallow magma emplacement using structural geology
- Methods included structural analyses, rock magnetism, and thermal modeling

USGS/NAGT Internship, Geodesy Intern, Cascades Volcano Observatory Summer 2018
- Aided in deploying semi-continuous GPS stations, gravity surveys, and GPS campaigns
- Field sites include Three Sisters, OR, Mt. St. Helens, WA, and Lassen Volcanic Field, CA, respectively

Undergraduate Thesis University of Wisconsin – Madison Advisor: Dr. Basil Tikoff 2017-2018
- Investigated the emplacement and deformational history of a granitic complex near the Western Idaho Shear Zone, ID
- Methods included microstructural analyses, and interpreting spatial patterns to U-Pb zircon ages and zircon Hf data

Lab Assistant University of Wisconsin – Madison, Structural Geology and Tectonics Group 2017-2018
- Assisted in paleomagnetic and gravity surveys at the Laguna del Maule volcanic field, Chile
- Assisted in preparing graphs and figures for publication

Teaching Experience

University of Wisconsin – Madison, Madison, WI
Graduate Teaching Assistant, Department of Geosciences 2021-Present
- Courses include Intro to Geologic Structures, Structural Geology, Introduction to Applied Geophysics, and Field Methods in Applied and Engineering Geophysics
- Instructed lab sections and focused on one-on-one learning
- Developed and graded labs, homework, quizzes, and exams

Undergraduate Students Advised
- Will Hazeltine, Senior Thesis: "Gravity survey of the Borralan intrusion, Scotland", 2024
- Kate Akin, Senior Thesis: "Fabric study of the Borralan intrusion, Scotland", 2024
- Ann Everest, Field Assistant for Gravity Survey, 2024
- Patrick Penne, Senior Thesis: "Documenting variations in microstructures and petrology relative to emplacement features of the Duncan Hill pluton, WA", 2023
- Sophia Thompson, Field Assistant for Gravity Survey, 2023
- Kate Tobin, Field Assistant for Structural Survey, 2021

University of Wisconsin – Platteville/Baraboo, Baraboo, WI Fall 2024
Lecturer, Department of Civil Engineering
- Lecturer for Physical Geology
- Taught lecture and lab section for introductory geology
- Developed syllabus, lecture content, exams, quizzes, and lecture assignments

Wasatch-Uinta Field Camp, Utah 2021-2023
Head Teaching Assistant, Wasatch-Uinta Field Camp Consortium
- Traditional six-week field course based out of the Wasatch and Uinta ranges in Utah
- Topics include constructing geologic maps and cross-sections, rock identification, and interpreting geologic field data

Iowa State University, Ames, IA 2018-2020
Graduate Teaching Assistant, Department of Geological and Atmospheric Sciences
- Courses include How Earth Works (Geol 100), Environmental Geology, and Geology for Engineers and Environmental Scientists
- Instructed labs, and graded labs, homework, and exams

Field Experience

Gravity Fieldwork, Laguna del Maule volcanic field, Chile, Duration: Four weeks 2024
Field Camp Instruction, Wasatch-Uinta Field Camp, UT, Duration: Three six-week sessions 2021-2023
Gravity Fieldwork, Kilauea volcano, HI, Duration: Three weeks 2023
Field Course Instruction, Black Hills, SD, Duration: One week 2022
Field Assistant, Watersmeet, MI, Duration: Two days 2022
Structural Fieldwork, Duncan Hill pluton, Cascades, WA, Duration: Five weeks over two sessions 2021,2022
Structural Fieldwork, Shonkin Sag laccolith, Central MT, Duration: Two weeks 2019
Geodetic Fieldwork, Lassen volcanic field, CA, Duration: Two weeks 2018
Gravity Fieldwork, Mt St Helens, WA, Duration: Two days 2018
Geodetic Fieldwork, Three Sisters, OR, Duration: One week 2018
Gravity Fieldwork, Laguna del Maule volcanic field, Chile, Duration: Three weeks 2018
Field Camp, Wasatch-Uinta Field Camp, UT, Duration: Six weeks 2017

Community Service

Very Early Career Seminar Series, University of Wisconsin – Madison 2023-2025
- Established, organized, and co-led inaugural and second year of series

Geoscience Graduate Student Association, University of Wisconsin – Madison 2021-2025
- Student Ombudsman, 2023-2024
- GeoPath Chair, 2022-2023, 2024-2025
- Secretary, 2021-2022

Association for Women Geoscientists, University of Wisconsin –Madison 2021-2024
- Vice President, 2023-2024
- Treasurer, 2021-2023

Geology Graduate Student Organization, Iowa State University 2019-2020
- Vice President, 2019-2020