SARAH DENDY

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EDUCATION

PhD University of Illinois, Urbana-Champaign, Geology Dec 2022
Dissertation:
DEVELOPING QUATERNARY PALEOCLIMATE AND PROVENANCE FROM LOESS DERIVED PROXIES OF MIDCONTINENTAL NORTH AMERICA
Committee:
Dr. Jessica L. Conroy (PI), Dr. William R. Guenthner, Dr. David A. Grimley

BA University of California, Berkeley, Marine Science Dec 2011

HONORS AND AWARDS

Illinois SLOAN UCEM Scholar 2017
$10,000 scholarship to be applied to academic and professional development over the course of a Ph.D. The scholarship includes 2 professional development seminars each semester, and 2 admissions to the annual Institute of Teaching and Mentoring conference.

Harvard University Certificate of Distinction in Teaching 2016
Scored 4.5 (out of 5) or higher on teaching evaluations for Natural Disasters (SPU12).

RESEARCH EXPERIENCE

University of Illinois, Urbana-Champaign, IL Anticipated completion Dec 2022
Graduate Research Fellow
Principle Investigator: Dr. Jessica L. Conroy

Thesis Chapter 1:
Development of detrital zircon U-Pb geochronology as a resilient loess provenance indicator

- Performed literary review
- Collected a large dataset from field samples and archived detrital zircon samples
- Developed a new method of provenance analysis
- Established a proof-of-concept comparing results to known parameters of glacial history during the late Quaternary
- Performed detrital zircon geochronology via Laser Ablation-Intercoupled Plasma-Mass Spectrometry
- Interpreted data utilizing Excel Macros and DZstats provided by the University of Arizona LaserChron Center
- Utilized multiple modes of statistical data analysis including Likeness, Similarity, Kuiper Tests, KS Tests, and Multi-Dimensional Modeling
- Published results in Quaternary Science Reviews in 2021

Thesis Chapter 2:
Improving constraint of downstream glacial sediment sources with loess detrital zircon geochronology

- Conducted literary review and gathered additional archive data
- Performed 3D multi-dimensional scaling analysis
- Utilized DZmix, DZstats, DZmds
- Manuscript in progress

Thesis Chapter 3:
Gastropods as paleoenvironmental indicators in loess of midcontinental North America

- Collected a large dataset from field samples and archived terrestrial gastropods
- Prepared gastropods for stable isotope analysis via acid treatment
- Explored the relationship between
- Generated an IsoScape spatial visualization of the data utilizing ArcGIS
- Manuscript in progress.

Harvard University, Cambridge, MA 2015 - 2016
Research Fellow
Advisor: Dr. Jerry X. Mitrovica

- Investigated the sensitivity of last interglacial sea-level highstands to ice sheet configuration during Marine Isotope Stage 6
- Conducted literary review
- Explored the impact of 3 possible penultimate glacial icesheet distributions on relative sea level
- Utilized MATLAB and Adobe Illustrator for visualization of ice response scenarios
- Published results in Quaternary Science Reviews in 2017

Central Caribbean Marine Institute, Little Cayman Island 2011
Intern

- Studied coral reef conservation and ecology
- Measured the growth and spalling rates of calcareous green algae (*Halimeda*).
- Investigated the impact of the *Halimeda* life cycle on local deposition rates and the local carbon cycle
- Developed research goals, methods, timeline, and implementation
- Reported findings in closing seminar

University of California, Berkeley, CA 2011
Undergraduate Research Apprentice

- Contributed to the development of a novel nanometer-scale goethite synthesis to determine unique reactive properties
- Managed data acquisition and communication

Lawrence Livermore National Laboratory, Berkeley, CA 2009 - 2010
Undergraduate Research Apprentice

- Studied ocean carbon cycle dynamics
- Contributed to the development of the Carbon Flux Explorer, an autonomous robot designed to observe ocean carbon sedimentation changes with daily resolution
- Provided support during initial launch of the Carbon Flux Explorer in the San Clemente Basin aboard the R/V Robert Gordan Sproul

Hubbs Fish Hatchery, Carlsbad, CA 2008
Intern

- Maintained a fish population to promote restoration of the California white sea bass
- Administered and documented experimental diet
- Assessed degree of developmental deficiencies

WORK EXPERIENCE

Illinois State Geologic Survey, Urbana, IL Summer 2022
Graduate Student Hourly Summer 2018

- Independently canvased for drilling permissions
- Independently conducted drilling, on-site core description and sample management for the Statewide Map initiative with remote guidance prior to the field excursion
- Split, described, and photographed core for potential publication
- Photo-catalogued cores for remote description
- Prepared samples for organic carbon dissolution, particle size analysis, OSL, XRF
- Compiled data from the GRU for specific research questions
- Uploaded official core descriptions
- Aided in core collection for the published Beaver Creek Quadrangle

Lamont-Doherty Earth Observatory, Palisades, NY 2016 - 2017
Research Staff Assistant

- Filtered deep sea core sediment samples for fossils
- Identified fossils and prepared fossils for analysis
- Conducted U-series and Strontium geochronological analysis of carbonate sea-level markers in an ultra-clean lab

Harvard University, Cambridge, MA
Lab Manager 2014 - 2015
Lab Assistant 2014

- Trained new lab users in safety protocol and mineral preparation
- Maintained and improved lab facilities and machinery
- Ensured lab compliance with the Environmental, Health and Safety Board

- Performed mineral preparation including rock crushing and mineral separation for U - Pb geochronological analysis, Re - Os analysis, and organic Carbon dissolution
- Utilized and maintained rock crushers, Wilfley Table, Frantz magnetic separator
- Conducted heavy liquids mineral separation
- Managed a continuously rotating sample flow path through a 7-day mineral separation process
- Completed geochronologic analysis via LA-ICP-MS at the Boise State Isotope Geology Laboratory

TEACHING EXPERIENCE

University of Illinois, Urbana-Champaign, IL
Teaching Assistant, Department of Geology

Structural Geology and tectonics	Fall 2022
Planet Earth	Spring 2022
Natural Disasters	Spring 2022
The Oceans (online)	Fall 2021
Emergence of Life	Spring 2021
History of Life	Fall 2020

Harvard University, Cambridge, MA
Teaching Fellow, Department of Earth and Planetary Science

Natural Disasters Spring 2016

- Conducted bi-weekly hands-on labs
- Graded promptly

Field Experiences in Earth and Planetary Sciences, Death Valley, NV Jan 2015

- Planned, purchased, and prepared meals for up to 34 people for 30-day remote course in Death Valley, NV
- Coordinated travel plans
- Conducted surface mapping
- Aided students in mapping efforts
- Graded student maps

Introduction to Earth Dynamics Fall 2014

- Conducted bi-weekly hands-on labs
- Aided in exam development and curriculum adjustments
- Held exam reviews
- Graded promptly

Canyonlands Field Institute, Moab, UT 2012
Outdoor Education Guide, AmeriCorps

- Certified NOLS Wilderness First Aid Responder

- Lived at and maintained a remote youth field camp in protected desert wilderness
- Repaired trails, yurts, teepees
- Planned, purchased, prepared meals for up to 40 people for 9-day remote field camps
- Mitigated invasive species
- Created curriculum and taught on subjects including Geology, Hydrology, Ecology, Anthropology, Conservation, and youth conservation activism for grades 4 – 12.
- Acted as a river guide for students and adult clients on multi-day rafting trips

PUBLICATIONS

Maps

D.A. Grimley, P. Szocinski, **S. Dendy**. Surficial geology of Beaver Creek Quadrangle, Bond County, Illinois: Illinois State Geological Survey, USGS-STATEMAP contract report, 2 sheets, 1:24,000, report, 9 p., 2019.

Journal Publications

S. Dendy, W.R. Guenthner, D. Grimley, J. Conroy, R. Counts. Detrital zircon geochronology and provenance of Pleistocene loess and contributing glacial sources, Midcontinental USA. Quaternary Science Review, 2021.

D. Grimley, R. Counts, J. Conroy, H. Wang, **S. Dendy**, C. Nield. Last glacial maximum ecology and climate from terrestrial gastropod assemblages in Peoria Loess, western Kentucky. Journal of Quaternary Science, 2020.

P. Clark, F. He, N. Golledge, J.X. Mitrovica, A. Dutton, J. Hoffman, **S. Dendy**. Oceanic forcing of deglacial and last interglacial se-level rise. NATURE, 2020.

S. Dendy, J. Austermann, J.R. Creveling, J.X. Mitrovica. Sensitivity of Last Interglacial Sea Level High Stands to Ice Sheet Configuration During Marine Isotope Stage 6. Quaternary Science Review, 2017.

Peer-Reviewed Articles for:
- Quaternary Science Reviews
- Illinois State Geologic Survey
- Earth Surface

PRESENTATIONS AND INVITED LECTURES

SESE Research Review; University of Illinois, Urbana-Champaign, Feb 2020
Poster: *U-Pb Age Density Distributions as an Indicator of Glacial Loess Provenance in Midwestern North America*

Geological Society of America, Annual Meeting, Oct 2019

Talk: *Detrital Zircon Geochronology and Provenance of Quaternary Loess in Central North America*

Geological Society of America, Annual Meeting, Nov 2018
Poster Presentation: *U-Pb Age Density Distributions as an Indicator of Glacial Loess Provenance in Midwestern North America*

Geological Society of America, North-Central Meeting, April 2018
Poster Presentation: *Regional Paleoclimate Inferences from Succineidae Gastropod Stable Isotope Analysis in Last Glacial Maximum Loess: Ward Quarry, Plainfield, and Clayton sections*

PLIOMAX, Jan 2016
Invited Talk: *The effect of the MIS 6 ice sheet configuration on interpreting last interglacial sea level highstands*

PROFESSIONAL TRAINING

Geological Society of America, Annual Meeting, Oct 2019
Workshop: Detrital Zircon Geochronology: Best Practices, Current Challenges, Future Opportunities

Institute on Teaching and Mentoring, Oct 2018

Geological Society of America, Annual Meeting, Oct 2017
Workshop: U-Th-Pb Geochronology, O and Hf isotopes and Trace Element Geochemistry Applied to Detrital Minerals

Revealing Your Hidden Core with X-Ray Fluorescence, Dec 2016
Columbia University, Lamont Doherty Earth Observatory
The construction of high-precision Astronomically calibrated Time Scales:
A short course and Workshop with applications in R

PROFESSIONAL AFFILIATIONS

Geological Society of America, Member

American Geophysical Union, Member

STEM Women and Allies in GeoScience, Co-Founder

Allies in STEM, Board Member

UIUC Department of Geology DEI Committee, Board Member

500 Women Geoscientists, Member

American Women Geoscientists, Member

COMMUNITY SERVICE

CU 1-TO-1
Mentor: Urbana Middle School and Urbana Elementary, 2017 – Present
Weekly meetings with single underrepresented minority youth to foster consistent and long-term mentorship towards completion of primary education and continuation into academic or vocational training.

LANGUAGES

English: Native Language
Spanish: Intermediate Listener, Intermediate Speaker, Intermediate Reading and Writing

COMPUTER SKILLS

Applications: DZstats, DZmds, DXmix, MatLab, Panoply, KaleidaGraph, Adobe Illustrator, Microsoft Excel Macros

Word Processing and Data Management: Box, Dropbox, Google Workspace, Microsoft Office, Microsoft 365, LaTeX, Mendeley

Communication Platforms: Zoom, Slack, Microsoft Teams, Microsoft Outlook

REFERENCES

Dr. David A. Grimley, Principal Research Scientist,
Quaternary Geologist
Quaternary and Engineering Geology
Illinois State Geological Survey, Prairie Research Institute
University of Illinois, Urbana-Champaign
615 E Peabody Dr, Champaign, IL 61820
Phone: 217-244-7324
Email: dgrimley@illinois.edu

Dr. Jerry Mitrovica, Frank B. Baird, Jr. Professor of Science
Department of Earth and Planetary Sciences
Harvard University
EPS, 20 Oxford St., Cambridge, MA 02138
Phone: 617-496-2732
Email: jxm@eps.harvard.edu