DR. MADELINE M. KELLEY

mkelley2@uno.edu
630 S Taft Hill Road, Fort Collins, CO 80521
412.956.6373

RESEARCH INTERESTS

I am a physical geographer and process geomorphologist interested in sediment transport. My work focuses on landscape mechanisms and the quantitative relationships between physical processes. I have experience conducting lab experiments in wind tunnels and flumes, field experiments in coastal, riverine, and desert environments, as well as modeling work.

EDUCATION

Arizona State University Graduated August 2023 (Tempe, AZ)
Ph.D. - Geography
School of Geographical Sciences and Urban Planning
Co-Advisors: Dr. Mark Schmeeckle, Dr. Ian Walker

University of Denver Graduated June 2018 (Denver, CO)
Master of Science - Geographic Information Science
Department of Geography and the Environment
Advisor: Dr. Hillary Hamann

University of Denver Graduated June 2016 (Denver, CO)
Graduate Certificate - Geographic Information Systems
University College

University of Pittsburgh Graduated June 2014 (Pittsburgh, PA)
Bachelor of Arts - Environmental Studies
Geographic Information Systems Certificate
Department of Geology and Environmental Sciences

ACADEMIC EXPERIENCE

Research Associate (University of New Orleans)
June 2023 - Current (New Orleans, LA)

- Post-doctoral researcher conducting laboratory experiments at UCSB and UNO using re-circulating flumes, laser scanners, ADCPs, flux measurements, and high-speed imagery
- Research focuses on improving understanding of river dynamics by relating flow and sediment movement and dune dimensionality

Graduate Teaching Assistant (Arizona State University)
January 2023 - April 2023 (Tempe, AZ)

- Instructor for Landscape Processes
- Lectured and developed course material on geographic characteristics of landforms and earth-surface processes, emphasizing erosion, transportation, deposition, and implications for human management of the environment

Physical Science Aid (NP03) Geomorphologist (U.S. Naval Research Laboratory)

June 2021 - December 2022 (Bay Saint Louis, MS)

- Collected Particle Imaging/Tracking Velocimetry (PIV/PTV) data of aeolian sediment transport processes in wind tunnel and field experiments
- Deployed the first field-based particle tracking velocimetry system for subaerial environments to unobtrusively measure velocity vectors of turbulence and the resulting aeolian sand transport across various wind regimes

Graduate Teaching Assistant (Arizona State University)
September 2020 - April 2021 (Tempe, AZ)

- Instructor for Introduction to Physical Geography Lab, which focused on the spatial and functional relationships among climates, landforms, soils, water, and plants
- Developed teaching and management skills while maintaining an understanding of course material

Physical Science Aid (NP03) Geomorphologist (U.S. Naval Research Laboratory)
May-September 2019 and May-September 2020 (Bay Saint Louis, MS)

- Scientist for the Sediment Mixing on the Ocean City Shelf (Multiphase turbulence experiment) project
- Gained experience in experimental design, instrument deployment, data collection/pre-processing, and analysis of sediment transport and the associated near-bed hydrodynamic forcing by waves, tides, and currents in the heterogeneous sedimentary environment on an inner shelf adjacent to the inlet of a micro-tidal estuary
- Presented results at the AGU 2019 and GSA 2019 conferences

Graduate Research Assistant (Arizona State University)
September 2018 - April 2020 (Tempe, AZ)

- Earth Surface Process and Geomorphology Lab under the direction of Dr. Ian Walker
- Prepared field equipment (TLS, UAS, and RTK GPS) for deployment, assisted with data collection to generate topographic data (pointcloud, raster, and vector) and change detection analysis

Graduate Teaching Assistant (University of Denver)
September 2016 - June 2018 (Denver, CO)

- Courses: Cartography, Intro GIS, Geographic Statistics, Water Resources and Sustainability, Hydrology, and Human Population
- Assisted professors with course preparation and lecture/lab tasks
- Developed lecture material, graded assignments and exams, updated lab assignments with software changes, and met with students outside of class

Undergraduate Research Assistant (University of Pittsburgh)
August 2013 - August 2014 (Pittsburgh, PA)

- Acquired knowledge of experimental design, data collection, statistical analysis, animal husbandry, and fieldwork
- Developed scientific reading and writing skills while reviewing research papers and preparing for lab meetings
- Senior Thesis: GIS analysis for prediction maps of long-term pesticide application and its impacts on amphibian populations

ADDITIONAL WORK EXPERIENCE

Research Volunteer (Grand Canyon Monitoring and Research Center/US Geological Survey)
April 2022 Flagstaff, Arizona (~10 day survey)

- Assisted in the annual survey of the fluvial-sourced aeolian dunes of the Colorado River by Grand Canyon Monitoring and Research Center

Field Paleontologist and GIS Analyst (Paleo Solutions)
June 2017 - August 2018 (Denver, CO)

- Field identification of geologic formations, collection, and recording of field data using Trimble devices, ArcGIS Collector, Kordata, and Avenza
- Generated maps and survey reports
- Gained experience working with sensitive data, strict deadlines, and collaborating with large teams across multiple companies and nationwide offices

Physical Scientist Researcher - Floodplain Mapping Specialist (Colorado Water Conservation Board)
January 2018 - August 2018 (Denver, CO)

- Applied knowledge of physical science, geography, hydrology and hydraulics, and GIS/RS to state-level water issues
- Supported projects related to flood hazard mapping that aimed to reduce flood loss, improve flood-informed development, and better digital data availability for statewide use
- Collaborated with FEMA managers and engineer consultants to ensure compliance with state and federal guidelines for topographic data collection, modeling standards, and additional mapping products.
- Organized outreach activities aimed at improving flood risk knowledge.
- Assisted with funding applications for LiDAR acquisitions related to the CTP and Hazard Mapping programs.

Information Services and Flood Warning Program Intern (Urban Drainage and Flood Control District)
March 2017 - January 2018 (Denver, CO)

- Developed proficiency in ArcGIS Desktop, ArcGIS Pro, ArcOnline, and HEC-RAS
- Created, maintained, and shared GIS databases, maps, and applications that support the organization's efforts to protect people, property, and the environment
- Employed GIS tools and methods for new floodplain delineation data review and provided project support and prepared board meeting presentations and project proposal maps

Student Contractor (U.S. Geological Survey)
October 2016 - March 2017 (Lakewood, CO)

- Contractor with the National Geospatial Technical Operations Center Transportation team
- Assisted with the management, review, and editing of the National Map data, including the Census TIGER roads and USFS/Census Roads

GIS Analyst (Purple Land Management)
September 2014 - June 2016 (Pittsburgh, PA)

- Used ESRI's suite of ArcGIS software to manage and visualize GIS data while leading large projects across multiple offices.
- Produced client products: plotted deed surveys, verified leases and conveyances of surface or subsurface rights, completed spatial analyses on gas well performance, acquisition of leasing units, and generated report maps.

PEER REVIEWED PUBLICATIONS

(*in progress*) M. Kelley, I. Walker, M. Schmeekle, C. Swann, R. Dorn, M. Roberts, P. O'Brien. Changes in Aeolian Saltation Cloud Properties with Wind Speed and Ripples.

Heintzman, R., Brandi, A., Kelley, M., Marvin, C.M. (2022). Student and Instructor Insights for an Online Synchronous Introductory Geography Lab Using iGEO 'Video Games': Fall 2020. Journal of Geography in Higher Education.

LaVanchy, G.T., Nyantakyi-Frimpong, H., Kelley, M. (2022). An Integrated Assessment of Vulnerability to Dry Spells and Agricultural Water Management Practices in Northern Ghana. Applied Geography.

González, C., Kelley, M., Marvin, M. C., López-Castañeda, N., Dorn, R. I., Schmeeckle, M. (2021). Regional piedmont incision during base-level rise in the northeastern Sonoran Desert, Arizona, USA. Physical Geography, 1-31.

Shandonay, K., Moll, H.L., Marvin, M.C., López-Castañeda, N., Kelley, M., Hilgendorf, Z., Heintzman, R. and Dorn, R.I. (2021). The Fieldwork of Shared Experiences. The Geographical Bulletin, 62(2), 82-88.

FIRST AUTHOR PRESENTATIONS

International Conference on Aeolian Research July 9-14 2023 Las Cruces, NM (10min talk): Near-bed fluid and particle measurements of aeolian sand transport

American Geophysical Union Fall Meeting December 10-14, 2022 (Poster): Near-bed fluid-particle interactions during aeolian saltation

European Geophysical Union General Assembly March 18, 2022 (7min talk): Splash dynamics of aeolian sediment transport

American Geophysical Union Fall Meeting December 10-14, 2021 (15min talk): Particle-bed interactions in a wind tunnel using Particle Tracking and Imaging Velocimetry

American Geophysical Union Fall Meeting December 10-14, 2019 (Poster): Hydrodynamic and sediment observations across the sand-mud inner shelf near Ocean City Inlet

Geological Society of America 2019 Annual Meeting September 22-25, 2019 (Poster): Observations across the sand-mud inner shelf during the multiphase turbulence experiment

Navel Research Lab February 2019 (30min talk): A New Flood Risk Communication Tool: A Proof-of-Concept Product for Boulder County, Colorado

American Geophysical Union Fall Meeting December 10-14, 2018 (Poster): A New Flood Risk Communication Tool: A Proof-of-Concept Product for Boulder County, Colorado

Colorado Association of Stormwater and Floodplain Managers September 25-28, 2018 (20min talk): Showcasing Boulder County's Flood Risk Information System (FRIS): Holistic Flood Risk Communication

American Association of Geographers April 10-14, 2018 (20min talk): Developing a Flood Risk Information System for Colorado

GIS in the Rockies September 21-22, 2017 (20min talk): Developing a Flood Risk Info System for Colorado: A Mixed Methods Approach

Colorado Association of Stormwater and Floodplain Managers September 19-22, 2017 (20min talk): Developing a Holistic Flood Risk Info System (FRIS) for Colorado

GUEST LECTURE

October 17, 2023. Geomorphology at UNO (New Orleans, LA) 'Aeolian Geomorphology'

September 28, 2023. Planetary Problems Science Talks (New Orleans, LA) 'Sand Transport by Wind and Water'

Summer 2023. Oceans and Atmospheres at UCSB (Santa Barbara, CA) 'Climate Change and Geomorphic Research'

Spring 2023. Fluvial Processes and Landforms at the University of Wisconsin-Eau Claire (virtual) 'Flood Mapping'

Spring 2020. Fluvial Processes at ASU (Tempe, AZ) 'Fluid mechanics, turbulence, and open channel flow'

Spring 2018. Hydrology at the University of Denver (Denver, CO) 'ArcHydro for watershed delineation'

AWARDS & HONORS

2023 ICAR XI Best Student Oral Presentation
2022 ASU Graduate College Completion Fellowship
2021 ASU Graduate and Professional Student Association Individual Travel Grant Award
2020 ASU SGSUP Matthew G. Bailey Scholarship Award
2020 ASU Graduate and Professional Student Association Individual Travel Grant Award
2019 ASU SGSUP Service Award
2019 ASU SGSUP Sunshine Award
2019 ASU Graduate and Professional Student Association Individual Travel Grant Award
2018 ASU SGSUP University Graduate Fellowship
2018 Dr. Laurance C. Herold Award for Outstanding Graduate Research in Geography
2018 Association for Women Geoscientists Outstanding Student Award
2017-2018 GIS in the Rockies Scholarship
2017 Dr. Laurance C. Herold Award for Outstanding Graduate Teaching Assistant in Geography
2017-2018 Laurance C. Herold Memorial Fund in support of field research in Geography
2017 Sustaining Watersheds Conference Scholarship Award

TECHNICAL SKILLS

Computer Languages: MatLab and Python

Software & Tools: ArcGIS Desktop, ArcOnline, ENVI, MatLab, Google Earth Engine, CloudCompare, Agisoft, HEC-RAS, RiSCAN, OpenFOAM, FIJI (ImageJ), OpenPIV & GeoDa, iRIC, FUDAA-LSPIV, PIVLab

Equipment Experience: Circulatory flume, Open-circuit wind tunnel, Terrestrial Laser Scanner, UAS (DJI), RTK GPS devices, Total Station, Automatic Level, PIV/PTV systems, 3D Sonic Anemometers, sand traps, wenglors, GoPros, ADCPs, and ADVs, sediment sieves, and Mastersizer.

WORKSHOPS

Fluvial Aeolian InteRactions on PLAnetarY surfaces workshop November 2023 (virtual participant)
Sediment Transport Short Course 2021 (Utah State University)
IRIC Workshop 2019: Introduction to Modeling River Flow and Morphodynamics (Golden, Colorado)

SERVICE AND LEADERSHIP

Mentorship: Micheala Roberts, ASU, School of Geographical Sciences Urban Planning, BS Geographic Information Science. Expected Graduation Spring 2024 (mprober2@asu.edu)
Mentorship: Colin Marvin, ASU, School of Geographical Sciences Urban Planning, BS Geography. Graduated Spring 2020 (mcmarvin@stanford.edu)
International Society of Aeolian Research Board Member July 2023 - Current
AGU EPSP Canvasing Committee Volunteer Spring 2022 - Current
AGU EPSP Graduate Student Committee Volunteer January 2022 - December 2023

AGU EPSP Connects Volunteer January 2022 - December 2023
Women in Science Program Fall 2021 - Spring 2022 Chair Arizona State University
YouthMappers Spring 2022 Volunteer Arizona State University
Association for Women Geoscientists (AWG) 2019 - 2020 ASU Student Chapter leader
Graduate Women's Association (GWA) 2019 - 2020 Representative Arizona State University
Graduate Student Committee Peer-to-Peer Coordinator Arizona State University 2020-2021
Graduate Student Committee Social Coordinator Arizona State University Fall 2019
Graduate and Professional Student Association Reviewer Arizona State University 2019 - 2020
Graduate Student Ambassador Representative Arizona State University Summer 2019
Graduate Student Committee President Arizona State University 2018 - 2019
Graduate Student of the Four Faculties Vice President University of Denver 2017 - 2018
Graduate Student Representative Geography and the Environment University of Denver 2017 - 2018
AAG-Esri Geomentor, Partnering with Arts Street Denver, CO October 2016

MEMBERSHIPS

(Board Member) The International Society for Aeolian Research
American Association of Geographers (AAG)
American Geophysical Union (AGU)
Association for Women Geoscientists (AWG)

REFERENCES

Dr. Robert Mahon (rcmahon@uno.edu) (406-241-1026)
Dr. Mark Schmeeckle (mschmeec@asu.edu) (480-241-9362)
Dr. Ian Walker (ianjwalker@ucsb.edu) (805-944-5149)