

Dr. Eyal Marder

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Professional Interests

My research is focused on links between earth surface processes, landscape evolution, geology, biodiversity, and climate change. I follow a multidisciplinary approach using an amalgam of methods, namely numerical modeling, geochronology, field methods, digital topographic analysis, GIS, remote sensing, and drone surveys. My main research questions are (1) what shape orogenic and post-orogenic landscapes over millions of years? (2) what is the role of climate on landscape and channel morphology? (3) how is biodiversity linked and respond to landscape evolution? (4) what are the relative roles of tectonics, climate, and surface processes on natural hazards at Quaternary timescales? (5) what are the impacts of glacial retreat on landscape morphology and drainage reorganization?

Professional Preparation

Indiana University	Postdoctoral Researcher		06.2022–present
Research Topic: Integrating tectonics, surface processes and paleo-biodiversity using numerical and observational approaches			
Mentor: Dr. Brian Yanites			
Colorado State University	Earth Sciences	PhD	05.2022
Thesis: From the Colorado Front Range to global topography: evaluating the roles of tectonics and climate on long term landscape evolution			
Advisor: Dr. Sean F. Gallen			
University of Haifa	Marine Geosciences	MS	08.2016
Thesis: The geomorphology and morphotectonics of the Jordan Valley Fault			
Advisor: Dr. Revital Bookman & Dr. Sagi Filin			
Hebrew University	Geology	BS	08.2010

Appointments

06.2022–present	Postdoctoral Researcher , Dept. of Earth and Atmospheric Sciences, Indiana University
08.2018–06.2022	Teaching and Research Assistant , Dept. of Geosciences, Colorado State University

01.2018-04.2018	Geological consultant , Ecolog Engineering Ltd., Israel
01.2013-12.2013	Geological consultant , Dr. Uzi and Boaz Saltzman Geology and Rock Engineering Ltd.
08.2010-08.2012	Research Assistant , Hebrew University & Texas A&M
12.2008-06.2010	Laboratory Assistant , Geological Survey of Israel

Publications

- **Marder, E.** and Gallen, S. F., 2023. Climate control on the relationship between erosion rate and fluvial topography: *Geology* (in press)
- **Marder, E.**, Bookman, R., and Filin, S., 2018. Geomorphological response of the Lower Jordan River basin to active tectonics of the Dead Sea Transform: *Geomorphology*, v. 317, p. 75–90
- **Marder, E.**, Gallen, S. F., and Pazzaglia, F. L., Late Cenozoic Deformation in the Southern Colorado Front Range Revealed by River Profile Analysis and Fluvial Terraces: *GSA Bulletin* (in review)

In preparation

- **Marder, E.** et al., Tectonic and geodynamic control on rejuvenation in the Colorado Rocky Mountains

Conference Sessions and Abstracts

- **Marder, E.**, Gallen, S. F., 2021. Unraveling the driver for recent topographic rejuvenation of the Colorado Rocky Mountains. *GSA Rocky Mountain Section Meeting, USA, 2022.*
- **Marder, E.**, Gallen, S. F., 2021. Searching for a Climate Signal in Fluvial Topography Using a Global Analysis of Long-Term Erosion Rates and Channel Steepness Data. *AGU Fall Meeting, USA, 2021.*
- **Marder, E.**, Gallen, S. F., 2020. New Evidence for Westward Tilting in the Southern Colorado Front Range. *GSA Connects Annual Meeting, USA, 2020.*
- **Marder, E.**, Gallen, S. F., 2019. Stream Piracy, Tilting, and Incision in the Upper Arkansas River Basin: Evidence from High Plains Terraces. *GSA Annual Meeting, 2019.*
- **Marder, E.**, Bookman R., Filin S., 2016. The Geomorphology and Morphotectonics of the Jordan Valley Fault, *IGS Annual Assembly.*

Invited Talks and Leading Sessions

- May 2023: Landscape Evolution across Time Scales from the High Plains to the Colorado Plateau, *GSA Rocky Mountain Meeting, USA.*
- February 2023: GFZ-Postdam, Dept. of Geosystems (Earth Surface Process Modelling section), Postdam, Germany
- November 2022: Indiana University, Dept. of Earth and Atmospheric Sciences, Indiana, USA

Professional Service

- Reviewing: *Earth Surface Processes and Landforms*

Awards and Honors

- Evelyn I. Clark Scholarship, Colorado State University, 2021
- AGeS2 Award, Geological Society of America, 2020
- On the Future Award, Geological Society of America, 2019
- John T. and Carol G. McGill Research Award, Geological Society of America, 2019
- Lary Kent Burns Memorial Scholarship, Colorado State University, 2019
- Joby Adams Geosciences Graduate Scholarship, Colorado State University, 2019
- Israel Ministry of Energy, Infrastructure, and Water Resources Fellowship, 2015-2017
- Research Grant for Masters Students, University of Haifa, 2014-2016
- Strauss Scholarship for Excellency for Master Students, University of Haifa, 2015
- Best poster, The 15th Israel Geomorphology Research Group Conference, 2015
- PERACH program, Israel, 2008

Teaching Experience

Earth Surface Processes	Indiana University	2022
Geologic Field Methods	Colorado State University	2022
Geology Summer Field Course	Colorado State University	2020-2021
Optical Mineralogy	Colorado State University	2020-2022
Introductory Geology Laboratory	Colorado State University	2018-2020

Field Experience

Tectonic geomorphology study of the Colorado Front Range, USA (Summer, 2019-2021 - 10 weeks)

- Basin average erosion rates (¹⁰Be) sampling
- Terrace dating for radiocarbon and optically stimulated luminescence
- Geological mapping
- Surficial mapping
- Stratigraphy
- Rock strength (Schmidt hammer, Structural from Motion imaging)
- Channel geometry (GPS, Rangefinder)
- Grain size (Picking, Sieving)

Remote sensing study of the Jordan Valley, Israel (Summer, 2015 - 2 weeks)

- Drone survey (total station, GPS, laser range finder, EDM)
- Surficial mapping

Software Experience

- Numerical modeling: Fastscape, Landlab, Python, Git, Matlab, Paraview, Fortran
- Digital topographic analysis: Matlab, ArcGIS Pro, R, Topotoolbox
- Remote sensing: Socet GXP (BAE Systems)
- Other: Adobe (Illustrator, Photoshop), Microsoft Office, Java

Lab Experience

- U-Th dating (Stalactites drilling, chemical preparation, isotope separation, AMS)
- ^{10}Be cosmogenic dating (Sieving, magnetic separation, chemical purification)
- OSL (Sampling and preparation)

Professional Development and Workshops

- ESPIn - Earth Surface Processes Modeling Summer Institute, University of Colorado, June 2020
- Student at the Department of Literature and Writing, Minshar College of Art, Tel-Aviv, 2014
- French course, Le Centre Culturel Français de Jérusalem Romain Gary, Jerusalem, 2012

Affiliations

American Geophysical Union	2021-present
Geological Society of America	2019-present
American Association of Petroleum Geologists	2019-2020
Israel Geological Society	2014-2018
Israel Geomorphology Research Group	2014-2018
Israel Geographical Association	2015-2018

Other & Hobbies

- Proficiency in English and Spanish, and some proficiency in Portuguese and French
- Actor at the Hai-Po theater, Haifa, Israel
- Professional hiker, kayaker, and experience in field trips around the world