

CURRICULUM VITAE

Yuval Shmilovitz

CIRES postdoctoral fellow

University of Colorado Boulder, CO, USA

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EDUCATION

- 2019-2023 Ph.D. in Hydrology and Water Resources
The Hebrew University of Jerusalem, Jerusalem, Israel
Advisors: Prof. Efrat Morin (HUJI), Prof. Yehuda Enzel, (HUJI), Prof. Itai Haviv (BGU)
Thesis: *Climatic imprints on arid cliff-related hillslope evolution: linking hydrogeomorphic processes across time scales*
- 2017-2019 M.Sc. in Hydrology and Water Resources
The Hebrew University of Jerusalem, Jerusalem, Israel
Advisors: Prof. Efrat Morin (HUJI), Prof. Yehuda Enzel, (HUJI), Prof. Itai Haviv (BGU)
Thesis: *Linking storm-scale rainfall regime with arid slope morphology and evolution*
- 2014-2017 B.Sc. with high honor in Earth Sciences and History (Magna cum laude)
The Hebrew University of Jerusalem, Jerusalem, Israel

PROFESSIONAL EXPERIENCE, VISITS & TRAINING

- 2024 – present PostDoctoral fellow, Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado Boulder, CO, USA
- May 2022 – July 2022 Visiting scientist, The Community Surface Dynamics Modeling System (CSDMS), University of Colorado Boulder, CO, USA
- Aug. 2020 Earth Surface Processes Institute (ESPIIn) summer school, University of Colorado Boulder, CO, USA
- Aug. 2018 Runoff Prediction in Ungauged Basins (PUB) summer school, Vienna University of Technology, Vienna, Austria
- June 2018 – Aug. 2018 Research Assistant, excellent student's summer project, The Hebrew University of Jerusalem, Jerusalem, Israel. Supervisor: Prof. Dov Avigad

GRANTS AND FELLOWSHIPS

- 2024-2027 Jewish National Fund (KKL-JNF) Forestry Division (\$120,000)**
Rainstorms and climate change impacts on soil erosion in the Northern Negev and effective preservation strategies
- 2024-2026 CIRES Postdoctoral Grant, University of Colorado Boulder (\$150,000) (sole PI)
Understanding hydrogeomorphic impacts of rainstorm variability on dryland headwater catchments
- 2022 Jewish National Fund (KKL-JNF) fellowship for climate change studies (\$13,500) (sole PI)
Soil erosion and characterization of extreme erosive events in arid areas
- 2021-2025 Collaborative Research, BSF-NSF (EAR-2100702/2100753) (\$239,902)*
Deciphering the role of extreme rainstorms and hydroclimatic regime on arid escarpment retreat and sub-cliff slope evolution

*Yuval Shmilovitz led the proposal writing but is not the official PI

**Yuval Shmilovitz is a research associate and collaborator on the proposal writing and is not the PI

AWARDS AND HONOURS

2024	Bentor Award (best Ph.D. dissertation), Institute of Earth Sciences, The Hebrew University of Jerusalem
2023	Peretz Grader award for an excellent early-career scientist, Israel Geological Society
2022	Student Research Award for Desert Research (Farouk El-Baz), Geological Society of America
2021	Outstanding paper by a PhD student, Israel Geographical Society
2018, 2019, 2020	The Advanced School for Environmental Studies' scholarship for academic excellence (awarded 3 times), The Hebrew University of Jerusalem
2015	Institute of Earth Sciences summer scholarship for excellent students, The Hebrew University of Jerusalem
2014, 2015, 2016	Dean's list for academic excellence (awarded 3 times), The Hebrew University of Jerusalem

TEACHING EXPERIENCE

2021 – 2023	The Hebrew University of Jerusalem	Summer Field Camp (field teaching, B.Sc., 2st year)
2020, 2021, 2023	The Hebrew University of Jerusalem	Introduction to Geomorphology (frontal & field teaching, B.Sc., 2/3st year)
2020	The Hebrew University of Jerusalem	Northern Negev Field Trip (field teaching, B.Sc., 2st year)
2020 – 2022	The Hebrew University of Jerusalem	Introduction to Geological Mapping (field teaching, B.Sc., 2st year)
2019, 2021 – 2023	The Hebrew University of Jerusalem	Geological Excursion in the Negev (field teaching, B.Sc., 2st year)
2017 – 2022	The Hebrew University of Jerusalem	The Dynamic Earth (frontal teaching, B.Sc., 1st year)

OUTREACH, SUPERVISING AND MENTORING

May 2025 & July 2024	Project mentor, The Earth Surface Processes Institute (ESPIN), CSDMS University of Colorado Boulder
2021 - 2023	Research project instructor (youth program), 'Kadim' educational center, Israel <i>Geomorphology and hydrology across the Ramon cliffs and slopes</i>
2021 - 2022	Bachelor project mentor, The Hebrew University of Jerusalem <i>Optimization of stochastic rainfall generator for arid regions</i>
2020 - 2022	Bachelor project mentor, The Hebrew University of Jerusalem <i>Rainfall spatiotemporal analysis in the central Negev using a convection-permitting climate model</i>

REVIEWER SERVICE

2025	<i>NSF proposal ad hoc reviewer (1), Earth Surface Processes and Landforms (1), Journal of Geophysical Research: Earth Surface (1)</i>
2024	<i>Geophysical Research Letters (1), Journal of hydrology (2)</i>
2023	<i>Water Resources Research (2)</i>

CONFERENCE SESSIONS CONVENED

- 2024 Co-convener (GM 4.2): Hydrogeomorphic cascading processes and hazards impacted by environmental changes and extreme events (at EGU annual meeting)
- 2023 Lead-convener (GM 11.1): Geomorphic perspectives of environmental changes and extreme events in drylands and beyond (at EGU annual meeting)
- 2022 Lead-convener (GM 10.2/CL 3.1/HS 13/NH 1): From hydro-climatology to hydro-geomorphology under extreme climatic events (at EGU annual meeting)
- 2022 Co-convener: Graduate student conference, Water Research in Israel, Technion, Haifa, Israel
- 2019 Co-convener: The 4th student seminar on innovations in hydrology and water resources, the Hebrew University of Jerusalem

PRESS AND QUOTATIONS

- 2025 *A Disaster foretold: The Failures That Led to the Deadliest Flood of the 21st Century (in Hebrew)* Yedioth-Net (ynet)
- 2025 *Dams failures intensified 2023 flood tragedy in Libya* CIRES Newsroom
- 2024 *Rainstorm Intensity Drives Desert Landscape Evolution* (Editor's highlights) AGU's EOS
- 2023 *Desert Landscape Evolution Controlled by Storm Intensity* (Editor's highlights) AGU's EOS
- 2021 *Researchers are using ICESat-2 elevation data to create bathymetry maps of shallow lakes in the remote desert* NASA Earth Observatory

INVITED TALKS

- May 2025 *On rainfall variability, erosion, and evolution of ephemeral landforms*, The Earth Surface Processes Institute, CSDMS, University of Colorado Boulder
- Feb. 2025 *Integration of high-resolution climate variability in the quantification of floods, erosion, and landscape evolution of ephemeral landforms*, Southwest Watershed Research Center, Tucson, AZ, USA
- June 2024 *On rainfall variability, erosion, and evolution of ephemeral landforms*, Colorado State University
- Nov. 2022 *Modeling long-term arid cliffs and sub-cliff slopes evolution under short-duration extreme rainstorm events*, CSDMS fall webinar
- April 2021 *Frequency analysis of storm-scale soil erosion and characterization of extreme erosive events by linking process-based erosion model and a stochastic rainfall generator*, Volcani Institute - Agricultural Research Organization, Israel

PUBLICATIONS

- 11 Armon, M., **Shmilovitz, Y (equal contribution)**., & Dente, E. (2025). Anatomy of a foreseeable disaster: Lessons from the 2023 dam-breaching flood in Derna, Libya, *Science Advances*, 11(13), eadu2865
<http://doi.org/10.1126/sciadv.adu2865>
- 10 **Shmilovitz, Y.**, Rossi, M. W., & Tucker, G. E. (2025). Multi-century erosion and landscape evolution of ephemeral catchments in response to sub-daily rainfall distribution changes, *Geophysical Research Letters*, 52(5), e2024GL113179. <https://doi.org/10.1029/2024GL113179>
- 9 **Shmilovitz, Y.**, Tucker, G. E., Rossi, M. W., Morin, E., Armon, M., Pederson, J., Campforts, B., Haviv, I., & Enzel, Y. (2024). Impacts of rainstorm intensity and temporal pattern on caprock cliff persistence and hillslope morphology in drylands. *Journal of Geophysical Research: Earth Surface*, 129(2), e2023JF007478. doi: <https://doi.org/10.1029/2023JF007478>
- 8 **Shmilovitz, Y.**, Marra, F., Enzel, Y., Morin, E., Armon, M., Matmon, A., Mushkin, A., Levi, Y., Khain, P., Rossi, Matthew W., Tucker, G., Pederson, J., & Haviv, I. (2023). The impact of extreme rainstorms on escarpment morphology in arid areas: Insights from the central Negev Desert. *Journal of Geophysical Research: Earth Surface*, 128(10), e2023JF007093. doi: <https://doi.org/10.1029/2023JF007093>
- 7 **Shmilovitz, Y.**, Marra, F., Wei, H., Argaman, E., Goodrich, D., Assouline, S., Morin, E. (2023). Assessing the controlling factors on watershed soil erosion during intense rainstorm events using radar rainfall and process-based modeling. *Catena*, 231, 107282. doi: <https://doi.org/10.1016/j.catena.2023.107282>
- 6 **Shmilovitz, Y.**, Shelef, E., Wieler, N., Zhang, H., Mushkin, A. (2023). Estimating the age of abandoned alluvial surfaces using morphologic dating of gully incision. *Journal of Geophysical Research: Earth Surface*, 128(3), e2022JF006875. doi: <https://doi.org/10.1029/2022JF006875>
- 5 **Shmilovitz, Y.**, Enzel, Y., Morin, E., Armon, M., Matmon, A., Mushkin, A., Pederson, J., Haviv, I. (2023). Aspect-dependent bedrock weathering, cliff retreat, and cliff morphology in a hyperarid environment. *GSA Bulletin* 2022; 135 (7-8): 1955–1966. doi: <https://doi.org/10.1130/B36442.1>
- 4 Wieler, N., Mushkin, A., Zhang, H., Sagy, A., Porat, N., **Shmilovitz, Y.**, Zhikun, R., Feipeng H., Pulong, S., Jinrui, L., Shelef, E. (2022). Geomorphic Dating of Across-Fault Gully Incision Reveals Time-Invariant Late Quaternary Slip-Rates at the Eastern Termination of the Altyn Tagh Fault. *Geophysical Research Letters*, 49(8), e2021GL096933. doi: <https://doi.org/10.1029/2021GL096933>
- 3 **Shmilovitz, Y.**, Marra, F., Wei, H., Argaman, E., Nearing, M., Goodrich, D., Assouline, S., Morin, E. (2021). Frequency analysis of storm-scale soil erosion and characterization of extreme erosive events by linking the DWEPP model and a stochastic rainfall generator. *Science of The Total Environment*, 787, 147609. doi: <https://doi.org/10.1016/j.scitotenv.2021.147609>
- 2 **Shmilovitz, Y.**, Morin, E., Rinat, Y., Haviv, I., Carmi, G., Mushkin, A., Enzel, Y. (2020). Linking frequency of rainstorms, runoff generation and sediment transport across hyperarid talus-pediment slopes. *Earth Surface Processes and Landforms*, 45(7), 1644-1659. doi: <https://doi.org/10.1002/esp.4836>
- 1 Armon, M., Dente, E., **Shmilovitz, Y.**, Mushkin, A., Cohen, T. J., Morin, E., Enzel, Y. (2020). Determining bathymetry of shallow and ephemeral desert lakes using satellite imagery and altimetry. *Geophysical Research Letters*, 47(7), e2020GL087367. doi: <https://doi.org/10.1029/2020GL087367>

CONFERENCE PRESENTATIONS

- 14 **Shmilovitz, Y.**, Rossi, M. W., Gensini, V., Ashley, W., Haberlie, A., & Tucker, G. E. (2025). Translating high-resolution climate change projections into erosion-vegetation feedbacks, sediment dynamics, and multi-century topographic evolution of dryland catchments. Oral presentation, EGU annual meeting.
- 13 **Shmilovitz, Y.**, Rossi, M., Tucker, G., (2024). Multi-century Sediment Yield and Topographic Evolution of Gullied Catchments: an Event-based Approach to Quantify the Effects of Changes in Rainfall Distribution, Oral presentation, AGU 2024 annual meeting
- 12 **Shmilovitz, Y.**, Rossi, M., Tucker, G., (2024). Gully development and soil erosion: An event-based approach using Landlab, Poster, CSDMS annual meeting
- 11 Dente, E., Armon, M., & **Shmilovitz, Y.** (2024). The September 2023 flood in Derna, Libya: an extreme weather event or man-made disaster? Oral presentation, EGU annual meeting (presented by ED)
- 10 **Shmilovitz, Y.**, Rossi, M., Tucker, G., Campforts, B., Pederson, J., Morin, E., Armon, M., Enzel, Y., Haviv, I. (2023). Simulating dryland cliffs evolution in response to extreme rainstorms, Poster, EGU annual meeting
- 9 **Shmilovitz, Y.**, Shelef, E., Wieler, N., Huiping, Z., Mushkin, A., (2022). Estimating the age of abandoned alluvial surfaces using morphologic dating of gully incision, Oral presentation, GSA Annual Meeting 2022 (presented by AM)
- 8 **Shmilovitz, Y.**, Marra, F., Enzel, Y., Morin, E., Armon, M., Matmon, A., Mushkin, A., Levi, Y., Khain, P., Haviv, I., (2022). The signature of extreme rainstorms properties on cliff morphology in arid areas, Pico, EGU annual meeting
- 7 **Shmilovitz, Y.**, Marra, F., Wei, H., Argaman, E., Nearing, M., Goodrich, D., Assouline, S., Morin, E., (2021). Frequency analysis of storm-scale soil erosion and characterization of extreme erosive events by linking process-based erosion model and a stochastic rainfall generator, Oral presentation, Eyal annual meeting, Zichron Yaakov, Israel
- 6 **Shmilovitz, Y.**, Mushkin, A., Wieler, N., Zhang, H., Shelef, E., (2021). Morphologic dating of gully incision on abandoned alluvial surfaces using a landscape evolution model, Oral presentation, The Israel Geological Society Annual Conference, Yerocham, Israel
- 5 **Shmilovitz, Y.**, Marra, F., Wei, H., Argaman, E., Nearing, M., Goodrich, D., Assouline, S., Morin, E., (2020). The role of rainstorm properties on crop-land soil erosion: coupling event-scale modeling with a stochastic rainfall generator for estimating erosion risks, Poster, AGU annual meeting
- 4 **Shmilovitz, Y.**, Enzel, Y., Morin, E., Armon, M., Matmon, A., Mushkin, A., Haviv, I., (2020). Aspect-dependent escarpment retreat, sediment mobilization and slope evolution under hyper-arid conditions., Poster., GSA annual meeting
- 3 **Shmilovitz, Y.**, Morin, E., Rinat, Y., Haviv, I., Carmi, G., Mushkin, A., Enzel, Y., (2020). Linking frequency of rainstorms, runoff generation and sediment transport across hyperarid talus-pediment slopes, Pico, EGU annual meeting
- 2 **Shmilovitz, Y.**, Morin, E., Rinat, Y., Haviv, I., Carmi, G., Mushkin, A., Enzel, Y., (2019). Linking frequency of rainstorms, runoff generation, and sediment transport: Implications for arid hillslopes evolution and reorganization, Poster, EGU Leonardo Conference, Esch-sur-Alzetter, Luxembourg
- 1 **Shmilovitz, Y.**, Morin, E., Rinat, Y., Haviv, I., Carmi, G., Mushkin, A., Enzel, Y., (2019). Linking hydro-metrology and geomorphology across hyper-arid talus-pediment slopes: frequency of runoff generating storms, sheetwash efficiency and form-processes relationships, Oral presentation, The Israel Geological Society annual conference, Kfar-Blum, Israel