Curriculum Vitae

Eitan Shelef
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Education

Ph.D. Geology and Environmental Sciences, Stanford University. 2014
Dissertation: *Constraints on the Form and Formation of Branched Channel Networks* (Advisor: Dr. George Hilley).

M.Sc. Geology, University of North Carolina, Chapel Hill. 2008
Thesis: *Deformation Processes Adjacent to Active Faults: Examples from Eastern California* (Advisor: Dr. Michael Oskin).

B.Sc. Geology and Environmental Sciences, Hebrew University of Jerusalem, Israel. 2004

Professional Experience

Associate Professor, 2023-present
Department of Geology and Environmental Science, University of Pittsburgh.

Assistant Professor, 2016-2023
Department of Geology and Environmental Science, University of Pittsburgh.

Research Fellow/Postdoctoral Researcher, 2015-2016
Department of Geology and Environmental Sciences, Ben Gurion University, Israel.

Postdoctoral Researcher, 2014-2015
Earth and Environmental Sciences Division, Los Alamos National Laboratory.

Ph.D. Student, Substitute Lecturer, RA, TA, 2008-2014
Department of Geology & Environmental Sciences, Stanford University.

M.Sc. Student, RA, 2005-2008
Department of Geology, University of North Carolina, Chapel Hill.

Funding

Heinz Endowment. (Role: Co-investigator) 2022-2024
Pittsburgh Collaboratory for Water Research, Education and Outreach (PI: Emily Elliot. Additional co-investigators: Dan Bain, John Gardner, Patrick Shirey).

National Science Foundation (Role: PI). 2022-2023
NSF-BSF, Geomorphology and Land-use Dynamics. Collaborative research: The Processes and feedbacks that induce multi-scale interactions between local divide migration, drainage reversal and escarpment evolution (Supplement funding for award # 1946253).

Impactful Resilient Infrastructure Sci. & Eng. (Role: Co-investigator). 2021-2023
Development of a Regional Landslide Inventory to Advance Hazard and Risk Estimates for Southwestern Pennsylvania (PI: Dan Bain. Additional co-investigators: Tony Iannacchione).

Heinz Endowment (Role: Co-investigator). 2021-2022
Pittsburgh Collaboratory for Water Research, Education and Outreach (PI: Emily Elliot. Additional co-investigators: Dan Bain, John Gardner).

National Science Foundation (Role: PI, US). 2020-2022
NSF-BSF, Geomorphology and Land-use Dynamics. Collaborative research: The Processes and feedbacks that induce multi-scale interactions between local divide migration, drainage reversal and escarpment evolution (Award # 1946253. Co-PIs: Liran Goren, Sean Gallen).

National Science Foundation (Role: PI), 2019-2022
NSF, Arctic Natural Sciences: Quantifying relations between erosion and permafrost thaw to improve predictions of ecosystem and carbon stocks response to a changing Arctic environment (Award # 1841400. Co-investigator: Mark Abbott).

Heinz Endowment (Role: Co-investigator). 2020-2021
Pittsburgh Collaboratory for Water Research, Education and Outreach (PI: Emily Elliot. Additional co-investigators: Dan Bain, John Gardner).

Heinz Endowment (Role: Co-investigator). 2019-2020
Pittsburgh Collaboratory for Water Research, Education and Outreach (PI: Emily Elliot. Additional co-investigators: Dan Bain, Brian Thomas).

Heinz Endowment (Role: Co-investigator). 2018-2019
Pittsburgh Collaboratory for Water Research, Education and Outreach (PI: Emily Elliot. Additional co-investigators: Dan Bain, Brian Thomas).

Central Research Development Fund (Role: PI, University of Pittsburgh). 2016-2018
Exploring structural symmetry in branched networks.

Department of Energy (Role: PI, through Los Alamos National Laboratory). 2015-2016
Analysis of Arctic Riverine Systems in the Context of C Cycling, Sediment Flux, and Climate Change.

Lieberman Fellowship (Stanford Graduate School). 2012-2013

ConocoPhillips fellowship. 2010-2011

Martin Fund Graduate Research Fellowship (UNC Chapel Hill). 2005-2006

Publications

∗ Student or post-doc advised, mentored, or co-advised by E. Shelef.

In Review

*Wondolowski, N., **Shelef, E.,** Thomas, B., Circumpolar hydrologic connectivity: regional changes in water storage in response to permafrost thaw. In review, *Geophysical Research Letters* (note: publication delayed because of COVID).

Published/Accepted

Rowland, J.C., Schwenk, J.P., **Shelef, E.,** Muss, J., Ahrens, D., Stauffer, S., Pilliouras, A., Crosby, B., Chadwick, A., Douglas, M.M. and Kemeny, P.C., 2023. Scale-dependent influence of permafrost on riverbank erosion rates. Journal of Geophysical Research: Earth Surface, p.e2023JF007101

Ben Asher, M., Mushkin, A., Lensky, N., Amit, R., Eppes, M., Ming, D., **Shelef, E.,** Sletten, R., 2023, Salt deliquescence along boulder cracks in the Antarctic Dry Valleys: An overlooked source of moisture. *Geomorphology*, p.108800.

*Rohan, T., **Shelef, E.,** Mirus, B., and Coleman, T., 2023, Prolonged Influence of Urbanization on Landslide Susceptibility. *Landslides*, Mar, 1-15.

*Shmilovitz, Y., **Shelef, E.,** Wieler, Nimrod., Zhang, Huiping., and Mushkin, Amit., 2023, Estimating the age of abandoned alluvial surfaces using morphologic dating of gully incision. *Journal of Geophysical research*, 128(3), p.e2022JF006875.

*Harel, E., Goren L., Crouvi O., Ginat H., and **Shelef, E.,** 2022, Drainage reorganization induces deviations in the scaling between valley width and drainage area. *Earth Surface Dynamics*, 10, 875–894.

Shelef, E., Griffore, M., Mark, S., Coleman T., *Wondolowski, N., Lasher, G. E., and Abbott, M., 2022, Sensitivity of erosion-rate in permafrost landscapes to changing climatic and environmental conditions based on lake sediments from Northwestern Alaska. *Earth's Future*, 10(8), p.e2022EF002779.

*Wieler, N., Mushkin, A., Zhang, H., Sagy, A., Porat, N., *Shmilovitz, Y., Shi, P., Ren, Z.,Huang, F., Shi, P., Liu, J., **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 (note: publication delayed because of COVID).

McHargue, T.R., Hodgson, D.M. and **Shelef, E.,** 2021, Architectural Diversity of Submarine Lobate Deposits. *Frontiers in Earth Science - Sedimentology, Stratigraphy and Diagenesis, 9:697170.*

Shelef, E., Goren, L., 2021. The rate and extent of windgap migration regulated by tributary confluences and avulsions. *Earth Surface Dynamics*, 9(4), 687–700.

U. Mishra, G. Hugelius, **E. Shelef**, Y. Yang, J. Strauss, A. Lupachev, J. W. Harden, J. D. Jastrow, C.-L. Ping, W. J. Riley, E. A. G. Schuur, R. Matamala, M. Siewert, L. E. Nave, C. D. Koven, M. Fuchs, J. Palmtag, P. Kuhry, C. C. Treat, S. Zubrzycki, F. M. Hoffman, B. Elberling, P. Camill, A. Veremeeva, A. Orr., 2021. Spatial heterogeneity and environmental predictors of permafrost region soil organic carbon stocks. *Science Advances* 7(9).

*Rohan, T., *Wondolowsky, N., and **Shelef, E.,** 2020, Landslide susceptibility analysis based on citizen reports, *Earth Surface Processes and Landforms*, 46(4), 791-803.

Eizenhofer, P., McQuarrie, N., **Shelef, E.,** Ehlers, Todd., 2019, Landscape response to lateral advection in convergent orogens over geologic time scales. *Journal of Geophysical Research: Earth surface*, 124(8), 2056-2078.

*Harel, E., Goren, L., **Shelef, E.,** Ginat, H., 2019. Drainage reversal toward cliffs induced by lateral lithologic differences. *Geology*, 47(10), 928-932.

Shelef, E., 2018, Channel profile and plan-view controls on the aspect-ratio of river basins. *Geophysical Research Letters*, 45(21), 11-712.

Shelef, E., Haviv, I., Goren, L., 2018, A potential link between waterfall recession rate and bedrock channel concavity, *Journal of Geophysical Research: Earth surface*, 123(5), 905-923.

Shelef, E., Rowland J. C., Wilson, C. J., Hilley, G. E., Mishra, U., Altmann, G. L., & Ping, C. L., 2017, Large uncertainty in permafrost carbon stocks due to hillslope soil deposits. *Geophysical Research Letters*, 44, 6134-6144.

Rowland, J.C., **Shelef, E.,** Gangodagamage, C., Pope, P.A., Brumby, S.P., Wilson, C.J., 2016, A morphology independent methodology for quantifying river planform change and characteristics from remotely sensed imagery, *Remote Sensing of Environment*, 184, 212-228.

Shelef, E., Hilley, G., 2016, Unified framework for modeling landscape evolution by discrete flows, *Journal of Geophysical Research: Earth surface*, 121(5), 816-842.

Moon, S., **Shelef, E.,** Hilley, G., 2015, Recent topographic evolution and erosion of the deglaciated Washington Cascades inferred from a stochastic landscape evolution model, *Journal of Geophysical Research: Earth surface*, 120(5), 856-876.

Shelef, E., Hilley, G., 2014, Symmetry, randomness, and process in the structure of branched channel networks, *Geophysical Research Letters*, 41, 3485-3493.

Shelef, E., Hilley, G., 2014, Impact of flow-routing on catchment area calculations, slope estimates, and numerical simulations, *Journal of Geophysical Research: Earth surface*, 118(4), 2105-2123.

Covault, J., **Shelef, E.,** Traer, M., Hubbard, S.M., Romans. B.W., Fildani, A., 2012, Deep-water channel run-out length: insights from seafloor geomorphology. *Journal of Sedimentary Research*, 82 (1), 25-40.

Shelef, E., Oskin, M., 2010, Deformation processes adjacent to active faults: Examples from eastern California, *Journal of Geophysical Research: Solid Earth*, 115(B5) , 5308-5332.

Oskin, M., Perg, L., **Shelef, E.,** Strane, M., Gurney, E., Singer, B., Zhang, X., 2008, Elevated shear zone loading rate during an earthquake cluster in Eastern California, *Geology*, 36 (6), 507-510.

Patent

Shelef, E., Lomask, J., Fildani, A., 2015, Method and systems for automatic detection and characterization of channel systems. U.S. Patent #8983114, filed by Chevron's Energy Technology Company.

Other Publications (non-peer reviewed)

Bain, D., Elliott, E., **Shelef, E.,** and Guy, M., 2021, Identifying Core Information to Answer Green Infrastructure Questions. University of Pittsburgh – Pittsburgh Collaboratory for Water Research, Education, and Outreach. Pittsburgh, Pennsylvania.

Zelnis, A., Schroering, C., Bey, J., Elliott, E., **Shelef, E.,** Bain, D., Perry, E., *Guy, M., 2020, Water and Sewer Affordability: An Insight into Water Equity in Allegheny County.

Elliott, E., Bain, D., **Shelef, E.,** River, M., Guy, M., 2020, Flooding in Southwestern Pennsylvania:: Knowledge Gaps and Approaches. DOI: 10.18117/w8rj-wb49.

Wieler, N., Mushkin, A., Zhang, H., **Shelef, E.,** Sagy, A., Ren, Z., Huang, F., Liu, J. and Shi, P., 2019, January. New constraints on Quaternary slip partitioning near the eastern termination of the Altyn Tagh fault in NW China. In Geophysical Research Abstracts (Vol. 21).

Coon, E., Berndt, M., Jan, A., Svyatsky, D., Atchley, A., Kikinzon, E., Harp, D., Manzini, G., **Shelef, E.,** Lipnikov, K., Garimella, R., Xu, C., Moulton, D., Karra, S., Painter, S., Jafarov, E., and Molins, S., 2019, Advanced Terrestrial Simulator. Next Generation Ecosystem Experiments Arctic Data Collection, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tennessee, USA. Version 0.88, https://doi.org/10.11578/dc.20190911.1.

McHargue, T.R., Hodgson, D.M. and **Shelef, E.,** 2019, Architectural Diversity of Submarine Lobes. Eartharxiv.org.

Bain, D., Elliott, E., Thomas, B., **Shelef, E.,** & River, M., 2019, Green Infrastructure for Stormwater Management: Knowledge Gaps and Approaches. Pittsburgh. DOI: 10.18117/p6tc9h.

Bain, D., Elliott, E., **Shelef, E.,** Thomas, B., & River, M., 2019, Water Quality in Southwestern Pennsylvania: Knowledge Gaps and Approaches. Pittsburgh. DOI: 10.18117/5ch6-k459.

Conference Abstracts and Meeting Presentations

Harel, E., Goren, L., Onn, C., Ginat, H., and **Shelef, E.,** 2023, Drainage reorganization disrupts scaling between drainage area and valley width, In EGU General Assembly Conference Abstracts (pp. EGU23-13884).

Goren, L., and **Shelef, E.,** 2023, Channel concavity controls drainage network complexity, In EGU General Assembly Conference Abstracts (pp. EGU23-12490).

Griffore, M., Abbott, M.B., and **Shelef, E.,** 2023, A 22,000-Year Sediment Record from Burial Lake, Alaska, Shows a Rapid Twofold Increase in Mercury Concentration in Response to Early Holocene Climate Change, In EGU General Assembly Conference Abstracts (pp. EGU23-3894).

Goren, L., *Harel, E., **Shelef, E.,** Crouvi, O., Ginat, H., 2022, Landscape evolution related to drainage reversals toward escarpments: Insights from the southeastern Negev Desert, Israel. Copernicus Meetings.

*Rohan, T. and **Shelef, E.,** 2021, The Prolonged Influence of Urbanization on Landslide Susceptibility Estimates. In AGU Fall Meeting.

*Harel, E., Crouvi, O., Porat, N., **Shelef, E.,** Ginat, H. and Goren, L., 2021, December. Assessing Rates of Divide Migration in Reversed Drainages Based on Dating of Abandoned Terraces in the Negev Desert. In AGU Fall Meeting.

*Qu, T., **Shelef, E.,** Goren, L., Prince, P., Gallen, S.F. and Lyons, N.J., 2021, December. Sustained Embayment of Shoulder Type Escarpments through a Feedback between Knickpoint and Divide Migration. In AGU Fall Meeting.

Shelef, E., Abbott, M.B., Griffore, M. and *Wondolowski, N., 2021, December. Sensitivity of erosion-rate in permafrost landscapes to environmental conditions based on a sedimentary record from Burial Lake, AK. In AGU Fall Meeting.

*Wieler, N., Mushkin, A., **Shelef, E.,** Zhang, H., Sagy, A., Porat, N., Ren, Z., Huang, F. and Liu, J., 2021, April. New constraints on Quaternary slip partitioning near the eastern termination of the Altyn Tagh Fault. In EGU General Assembly Conference Abstracts (pp. EGU21-12517).

Shelef, E., Goren, L., 2020, The influence of tributaries and their avulsions on the tempo and extent of valley-confined divide migration. In AGU Fall Meeting Abstracts (Vol. 2020, pp. EP019-0008).

*Qu, T., **Shelef, E.,** Goren, L., Prince, P., 2020, Feedback between Knickpoint and Divide Migration as Reflected in Paired Reverse and Truncated Channels. In AGU Fall Meeting Abstracts (Vol. 2020, pp. EP019-0006)

*Pamerleau, I., Reid, M., **Shelef, E.,** Rowland, J.C., Schwenk, J. and Mishra, U., 2020, December. Automated Mapping of Arctic Floodplains to Improve Estimates of Sediment and Carbon Fluxes. In AGU Fall Meeting Abstracts (Vol. 2020, pp. H137-0002).

*Wieler, N., Mushkin, A., Zhang, H., Sagy, A., Porat, N., Ren, Z., Feipeng, H., Jinrui, L., and **Shelef, E.,** 2020, New constraints on Quaternary slip partitioning near the eastern termination of the Altyn Tagh Fault. EGU General Assembly Conference Abstracts, 10.12517.

*Harel E., Goren L., **Shelef E.,** Crouvi, O., 2020, Width-Area scaling as a proxy for drainage reorganization. Annual conference of the Israel Geological Society.

*Pamerleau, I., *Reid, M., **Shelef, E.,** Rowland, J.C., Schwenk, J. and Mishra, U., 2020, Automated Mapping of Arctic Floodplains to Improve Estimates of Sediment and Carbon Fluxes. In AGU Fall Meeting Abstracts.

*Rohan, T.J., * Wondolowski, N. and **Shelef, E.,** 2020, Landslide Susceptibility Analysis Based on Citizen Reports. In AGU Fall Meeting Abstracts.

Goren, L., *Harel, E., **Shelef, E,** and Ginat, H, 2020, Migrating divides induce drainage reversal toward cliffs and escarpments. EGU General Assembly Conference Abstracts 10.1594.

Bain, D., Elliott, E., **Shelef, E.,** Guy, M., 2020, Green Stormwater Infrastructure – Charting a Collaborative Path Forward. Green Infrastructure Network Meeting. Pittsburgh, PA.

Guy, M., Forgrave, R., Copeland, M., *Rohan, T, Elliott, E., Bain, D., **Shelef, E.,** Zeyzus, R., 2020, Water Quality Monitoring Basics. Allegheny County Conservation District Advocate for your Watershed Series. Pittsburgh, PA.

Bain, D., Elliott, E., **Shelef, E.,** Guy, M. Quinn, A., Mercurio, E., Albert, S. 2020, Strategizing Regional Green Infrastructure Data Needs. Pittsburgh Water Collaboratory Meeting. Pittsburgh, PA.

Elliott, E., Bain, D., **Shelef, E.,** Guy, M., Murrell, A., Ehrenwerth, J., Herman, E. 2020, Water Sustainability Scholar Community Faculty Kickoff. Pittsburgh, PA.

Rabalais, N., Elliott, E., Bain, D., **Shelef, E.,** Guy, M., Ehrenwerth, J., Murrell, A., Herman, E., 2020, Three Rivers to the Gulf Opening Dialogue. Pittsburgh, PA.

Elliott, E., Bain, D., **Shelef, E.,** Guy, M., Ehrenwerth, J., Murrell, A., Herman, E., 2020, Three Rivers to the Gulf Opening Dialogue Second Chance. Pittsburgh, PA.

Fratkin, M.M., Rowland, J.C., Del Vecchio, J., Lathrop, E., Piliouras, A., Schwenk, J. and **Shelef, E.,** 2019, The Distribution and Occurrence of Solifluction Lobes and their Role in Mediating Hillslope Biogeochemistry. In AGU Fall Meeting Abstracts.

Shelef, E., *Wieler, N., Mushkin, A., Zhang, H., Sagy, A., Shi, P., Ren, Z. and Huang, F., 2019, Constraining the age of laterally offset gullies incised into an abandoned alluvial surface along the eastern termination of the Altyn Tagh Fault. In AGU Fall Meeting Abstracts.

*Harel, E., Goren, L., **Shelef, E,** and Ginat, H., 2019, Preferential Divide Migration as a New Mechanism for Drainage Reversal Toward Cliffs. In AGU Fall Meeting Abstracts.

*Rohan, T. and **Shelef, E.,** 2019, Analysis of 311 based Landslide Inventories for Landslide Susceptibility Mapping. In AGU Fall Meeting Abstracts.

*Wondolowski, N., **Shelef, E.** and Thomas, B.F., 2019, Influences of topography on permafrost meltwater. In AGU Fall Meeting Abstracts.

*Wieler, N.,Mushkin, A., Zhang, H., **Shelef, E.,** Sagy, A., Ren, Z., Huang, F., Shi, P., 2018, New constraints on Quaternary slip partitioning near the eastern termination of the Altai Tagh fault in NW China. In AGU Fall Meeting Abstracts.

*Harel, E., Goren, L., **Shelef, E.,** Ginat, H., 2018, A new mechanism for flow reversal across topographic escarpments: a general model and field examples. In AGU Fall Meeting Abstracts.

Rowland, J. C., Schwenk, J., **Shelef, E.,**, Mishra, U., Muss, J., Stauffer, S., 2018, Pan-arctic flux of soil organic carbon to rivers by river bank erosion. In AGU Fall Meeting Abstracts.

*Rohan, T., **Shelef, E.,** 2018, The Influence of Geomorphological Processes on Damage to Urban Structures. In AGU Fall Meeting Abstracts.

*Wondolowski, A. W., **Shelef, E.,** Abbott, M. B., 2018, A Sedimentary record from Burial lake, AK, reveals a covariance between erosion rate, permafrost thaw, and climate. In AGU Fall Meeting Abstracts.

Goren, L., Bruber, C., *Harel, E., **Shelef, E.,** Nativ, R., Ginat, H., 2018, Fluvial reorganization across scales. EGU General Assembly Conference Abstracts 20, 7265.

Shelef, E., 2017, A (very) Simple Model for the Aspect Ratio of High-Order River Basins. In AGU Fall Meeting Abstracts.

Rowland, J. C., Muss, J. D., **Shelef, E.,** Stauffer, S. J., Mishra, U., & Sutfin, N. A., 2016, The contribution of particulate carbon to arctic rivers from river bank erosion of floodplains. In AGU Fall Meeting Abstracts.

Rowland, J. C., Muss, J. D., **Shelef, E.,** Stauffer, S. J., & Mishra, U., 2016, Quantifying the export of floodplain soil carbon to Arctic rivers by bank erosion. GSA meeting.

Rowland, J. C., Muss, J. D., **Shelef, E.,** Stauffer, S. J., & Mishra, U., 2016, Floodplain and deltaic controls on the flux of particulates from Arctic watersheds to the ocean. DOE Regional Climate Modeling Program Annual PI meeting.

Shelef, E., Haviv, I., Goren, L., 2016, Reconciling retreat rates of vertical vs. non-vertical knickpoints, and a potential link to bedrock channel concavity, in GSI Annual Meeting Abstracts.

Shelef, E., Rowland, J. C., Wilson, C. J., Altmann, G., Hilley, G. E., 2014, Impact of downslope soil transport on carbon storage and fate in permafrost dominated landscapes, in AGU Fall Meeting Abstracts, B31G-0126.

Shelef, E., Hilley, G., 2013, Erosional Mechanics and the Structure of Branched Channel Networks, in AGU Fall Meeting Abstracts, EP53B-0790.

Hilley, G., **Shelef, E.,** Fildani, A., Charles K. Paull., Katherine L. Maier., 2012, Automated Detection and Characterization of Submarine and Subaerial Channels Using Wavelet Analysis, in AGU Fall Meeting Abstracts, EP41B-0779.

Shelef, E., Hilley, G., 2012, (Yet) A New Method for the Determination of Flow Directions and Contributing Areas over Gridded DEMs, in AGU Fall Meeting Abstracts, EP41C-0808.

Goodfellow, B., Hilley, G., Chadwick, O., Schulz, M., **Shelef, E.,** Hilley, G., 2011, Climatic thresholds, base level, and the depth and intensity of chemical weathering, in AGU Fall Meeting Abstracts, EP43C-0711.

Moon, S., **Shelef, E.,** Hilley, G., 2011, A field- and modeling- based study of the denudation and topographic evolution of the Washington Cascades, in AGU Fall Meeting Abstracts, EP44B-06.

Shelef, E., Hilley, G., 2011, Correlation Between Channel Profile and Plan View Drainage Network Architecture, in AGU Fall Meeting Abstracts, EP21B-0679.

Hilley, G., Arrowsmith, R., Gudmundsdottir, M., **Shelef, E.,** Traer, M., 2010, Topographic and geomorphic response to active deformation along the dragon's back pressure ridge, central San Andreas fault, California (invited), in AGU Fall Meeting Abstracts, vol. 1, p. 04.

Shelef, E., Hilley, G., 2010, Plan view and profile relations: Measuring correlation between channel profile and network morphology, in AGU Fall Meeting Abstracts, vol. 1, p. 577.

Shelef, E., Hilley, G., 2009, Testing conditions for valley networks formation by discrete erosional events, in AGU Fall Meeting Abstracts, vol. 1, p. 0592.

Shelef, E., Hilley, G., 2008, A (somewhat) mechanistic hypothesis for the formation of valley networks, in AGU Fall Meeting Abstracts, vol. 1, p. 1074.

Shelef, E., Oskin, M., Fialko, Y., 2006, Combining geologic and InSAR measurements to gain new insights into active distributed anelastic strain, in SCEC annual meeting, proceedings and abstracts., vol. 1, p. 161.

Shelef, E., Oskin, M., Fialko, Y., 2006, Distributed anelastic strain and its relationship to compliant zones surrounding active faults of the Eastern California shear zone, in AGU Fall Meeting Abstracts, vol. 1, p. 0439.

Oskin, M., Perg, L., **Shelef, E.,** Strane, M., Gurney, E., Blummentritt,D., Mukhopadhyay, S., Iriondo, A., 2006, Geologic fault slip rates support transitory, elevated geodetic strain accumulation across the mojave desert, Eastern California shear zone, in AGU Fall Meeting Abstracts, vol. 1, p. 0992.

Invited Talks

Arctic Forum, University of Pittsburgh, PA. 2022
Sensitivity of erosion in permafrost landscapes to environmental conditions (based on a sedimentary record from Burial Lake, AK)

Temple University, Philadelphia, PA. 2021
Drainage divide configuration, the form of drainage basins and their response to external forcing

Eidgenössische Technische Hochschule (ETH, Earth Surface group), Zurich, Switzerland. 2021
The dynamics of windgap migration

Hebrew University of Jerusalem, Jerusalem, Israel. 2020
Drainage divides, the form of drainage basins, and their response to external forcing.

Science on the Stage Seminar, Carnegie Mellon University, Pittsburgh, PA 2020
Climate and Change

China Earthquake Agency (CEA), Beijing, China. 2018
Permafrost, river networks, and some potential impacts on climate and humans

University of North Carolina Chapel Hill. 2017
Large uncertainty in permafrost carbon stocks due to hillslope soil deposits

Amtrak Meeting, Penn State, PA. 2017
Hillslopes, permafrost, soil carbon, and their potential influence on Earth's climate

Stanford University, CA. 2017
Large uncertainty in permafrost carbon stocks In arctic Areas

Eidgenössische Technische Hochschule (ETH, Earth Surface group), Zurich, Switzerland. 2016
Analysis of subaerial and submarine [and subsurface] channel systems

University of Haifa, Haifa, Israel. 2016
Automatic detection and characterization of channel systems

University of California Los Angeles, Los Angeles, CA. 2015
Permafrost hillslopes, symmetric channel networks, and some potential impacts on climate and humans

University of Pittsburgh, Pittsburgh, PA. 2015
From Pattern to Process to Impact

California Institute of Technology, Pasadena, CA. 2014
Symmetry, randomness, and process in the structure of branched channel networks

Shell Technology Company, Houston, TX. 2013
Relating Shape and Process: Examples from Geomorphology

Los Alamos National Laboratory, Los Alamos, NM. 2013
Erosional mechanics and the structure of branched channel networks

Association of Environmental and Engineering Geologists, Oakland, CA. 2013
Randomness and Organization in Branched Channel Networks

Stanford's project on deep water depositional systems, Oxnard, CA. 2012
Automated detection and characterization of channel systems

Hebrew University of Jerusalem, Jerusalem, Israel. 2010
Quantifying distributed deformation along active strike slip faults in Eastern California

Center For Computational Earth and Environmental Sciences, Stanford, CA. 2010
Building a computational tool-set for geomorphologists

Southern San Andreas Fault Earthquake Workshop, Pomona, CA. 2008
Deformation processes adjacent to active faults; Examples from Eastern California

Field Work

Alaska Range and North Slope, Alaska 2022
Drone-based mapping, coring of bogs and thermokarst features, soil sampling.

Arava and Ovil Escarpments, Israel 2022
Surveyed morphometric and sedimentary patterns associated with escarpment evolution.

Appalachian Valley and Ridge, West Virginia 2021
Sampling cosmogenic radio nuclides.

North Slope, Alaska 2021
Coring lake sediments.

Alaska Range and North Slope, Alaska 2018
Sampling soil and active layer thickness, drone-based mapping.

Altai Tagh Fault, China 2018
Surveyed offset channels, alluvial fans, and drainage reorganization along the fault.

Arava Escarpment, Israel 2018
Surveyed morphometric and sedimentary patterns associated with channel reversal.

Seward Peninsula, Alaska 2017
Conducted geophysical measurements and sampled soil along hillslopes .

Negev Desert, Israel 2016
Surveyed drainage divides along medium scale escarpments.

Seward Peninsula, Alaska 2014
Excavated and sampled permafrost soils.

Hawai'i, Kaua'i 2011
Surveyed rock weathering features along climatic gradients.

Mojave Desert, CA 2008
Measured and mapped rotated lithologic features along the Harper-Lake fault.

Mojave Desert, CA 2007
Mapped quaternary deposits along the Ludlow Fault.

Mojave Desert, CA 2006
Mapped and sampled volcanic and quaternary deposits along the Pisgah, Blackwater and Ludlow Fault.

Honors and Fellowships

ARIS award (Advancing Research Impact In Society) to the Pittsburgh Water Collaboratory Leadership Team (member of leadership team as Associate Director). 2022

Lieberman Fellowship (Stanford Graduate School). 2012-2013

Stanford's Centennial Teaching Assistant Awards (School of Earth Sciences). 2011

Conoco Phillips fellowship (ConocoPhillips, Stanford). 2010-2011

Roy L. Ingram Graduate Research Award (UNC Chapel Hill). 2007

Martin Fund Graduate Research Fellowship (UNC Chapel Hill). 2006

Martin Fund Graduate Research Fellowship (UNC Chapel Hill). 2005

B.Sc. Magna Cum Laude (Hebrew University). 2004

Student's Dean Award (Hebrew University). 2004

Galilee Regional Council Fellowship (Hebrew University) 2003

Dean's List for Students (Hebrew University) 2002-2003

Education Ministry Fellowship (Hebrew University) 2002

Teaching

Courses

Geomorphology: dynamic evolution of Earth's surface (GEOL1062), University of Pittsburgh (taught in alternate years, typical enrollment: 25-30 undergraduate students): An undergraduate course that introduces students to different landforms and the processes that shape them from a physical perspective that relies on conservation laws as a cornerstone in understanding geomorphologic processes. The course combines directed reading, field data collection, and group work.

Quantitative methods in geoscience with MATLAB (GEOL2468), University of Pittsburgh (taught every fall semester, typical enrollment: 5-12 graduate students): A required 4-credit course for incoming graduate students that provides an introduction to programming in MATLAB, as well as to a variety of quantitative analyses that are commonly used in Geoscience, including: uni, bi, and multi variate statistics, dimensional analysis, signal processing, spectral analysis, and spatial interpolation. The course combines hands-on class assignments, extensive home assignments, and a group project that combines field data collection with different data analysis techniques.

Analysis of Earth's surface (GEOL2469), University of Pittsburgh (taught in alternate years, typical enrollment: 5-6 graduate students): A graduate course that introduces students to advanced quantitative analyses of digital topographic datasets in the context of geomorphologic processes. The class combines the development of algorithms for topographic analysis in MATLAB, guided reading of recent literature, field data collection, and a group research project.

Conservation laws and Earth surface dynamics (GEOL2470), University of Pittsburgh (taught in alternate years, typical enrollment: 5-8 graduate students): A graduate course that examines an array of physical processes that modify Earth's surface. The course combines directed reading and field data collection with guided exploration of analytical and numerical models based on physical conservation laws.

Tectonic geomorphology (GEOL3923), University of Pittsburgh (taught every year, both in summer and fall semesters, typical enrollment: 5-8 graduate students): A graduate course that introduces students to up-to-date research in tectonics and geomorphology. The course builds on reading and discussion of recent papers, and draws links between these readings and students research. Co-taught with Dr. Nadine McQaurrie.

Answering regional challenges in water sustainability (GEOL2020), University of Pittsburgh (enrollment: 11 students): An interdisciplinary course that aims to train students with data collection and analysis for addressing regional water challenges. Through this course students examine regional flooding issues in collaboration with AGU's Thriving Earth Exchange program, and are trained in data synthesis and analysis, project-based learning, and production of deliverables that communicate science to the public. Co-taught with: Drs. Daniel Bain, Brian Thomas, and Emily Elliot.

Geology of the Arabian-African plate boundary in the Negev, Israel, Ben-Gurion University (taught in 2015, field instructor, enrollment: 25 undergraduate students): A field course focused on the geologic history of the Arabian-African plate boundary as reflected in stratigraphic and structural observations in the Negev Desert, Israel.

Teaching at the University of Pittsburgh

2022 - 2023 Academic Year:
– Analysis of Earth's Surface (GEOL2469, currently taught).
– Tectonic Geomorphology (GEOL3923, currently taught).

2021 - 2022 Academic Year:
– Geomorphology: dynamic evolution of Earth's surface (GEOL1062).
– Tectonic Geomorphology (GEOL3923).
– Quantitative methods in geoscience with MATLAB (GEOL2468).

2020 - 2021 Academic Year:
– Quantitative methods in geoscience with MATLAB (GEOL2468).
– Analysis of Earth's Surface (GEOL2469).
– Tectonic Geomorphology (GEOL3923).

2019 - 2020 Academic Year:
– Quantitative methods in geoscience with MATLAB (GEOL2468).
– Geomorphology: dynamic evolution of Earth's surface (GEOL1062).
– Tectonic Geomorphology (GEOL3923).

2018 - 2019 Academic Year:
– Quantitative methods in geoscience with MATLAB (GEOL2468).
– Tectonic Geomorphology (GEOL3923).
– Conservation laws and Earth surface dynamics (GEOL2470).

2017 - 2018 Academic Year:
– Analysis of Earth's Surface (GEOL2469).
– Quantitative methods in geoscience with MATLAB (GEOL2468).
– Answering Regional Challenges in Water Sustainability (GEOL2020).
– Tectonic Geomorphology (GEOL3923).

2016 - 2017 Academic Year (arrived to Pitt on August 2016):
– Quantitative methods in geoscience with MATLAB (GEOL2468).

Student Mentoring

Graduate and Postgraduate Advisees and Awards

Current:

* Fan Gao (Ph.D. student, University of Pittsburgh, Role: Advisor) 2022-present
  Research: Using gully topography to date alluvial surfaces.

* Emrah Ozpolat (Ph.D. student, University of Pittsburgh, Role: Advisor) 2021-present
  Research: Erosion in permafrost covered landscapes.
  Awards:
  -GSA graduate student research grant (2022).

-Dr. J. Frederick and Ann Sarg Research Award (2022).
-Henry Leighton Memorial Graduate Scholarship (2022).

* Tianyue Qu (Ph.D. student, University of Pittsburgh, Role: Advisor) 2019-present
Research: Drainage reorganization next to cliffs.

* Elhanan Harel (Ph.D. student, Ben Gurion University, Israel, Role: Co-advisor with Drs. Liran Goren and Onn Cruvi) 2018-present
Research: Influence of lithologic, tectonic and climatic forcing on fluvial reorganization next to topographic escarpments.
Awards:
-Prof. Rahamimoff Travel Grant for Young Scientist (2020).
-Lev-Zion Fellowship (2018).

* Tyler Rohan (Ph.D. student, University of Pittsburgh, Role: Advisor) 2017-present
Research: Landslides in urban settings.
Awards:
-Andrew Mellon Predoctoral Fellowships (2021).

Former:

* Nimrod Wieler (Post-doctoral scholar, Israel Geological Survey, Role: Co-advisor with Dr. Amit Mushkin) 2018-2021
Research: Reconstructing offset rates along the Altyn Tagh Fault, China.
Current position: Lead geologist, Israel Archeological Authority, Israel.

* Burch Fisher (Post-doctoral scholar, University of Pittsburgh, Role: Advisor) 2016-2017
Research: Incisional wave in response to a recent basin capture in the Rio Iruya watershed, Argentina.
Current position: Affiliate Researcher, UC Santa Barbara, USA.

* Nick Wondolowski (M.Sc student, University of Pittsburgh, Role: Co-Advisor with Dr. Mark Abbott) 2017-2020
Research: Hydrologic-geomorphologic interactions in permafrost covered landscapes.
Awards:
-University of Pittsburgh GPSG Travel Grant (2020).
-University of Pittsburgh GSO Travel Grant (2020).
-Geological Society of America Research Grant (2019).
-Arctic Institute of North America Grant-in-Aid (2019).
-SEPM Graduate Research Grant, Society for Sedimentary Geology (2018).
-Henry Leighton Memorial Graduate Scholarship (2018).
Current position: Code developer and testers. Prop Logic Studios Inc., USA.

* Eyal Marder (M.Sc. student, Haifa University, Israel, Role: Co-advisor with Dr. Revital Bookman) 2017-2018
Research: Neo-tectonics of the Central Jordan Valley from topographic analysis and geophysical

measurements.
Current position: Ph.D. student, Colorado State University, USA.

Undergraduate Students Researchers

Current:

* Olivia Jenkins (University of Pittsburgh, Role: Advisor) 2021-present
Research topic: Outreach project focused on drainage reorganization.

Former:

* Ashley Solenday (First Experience in Research Program [U. of Pittsburgh], Role: Advisor) 2023
Research topic: Controls on landslides velocity in Pittsburgh, PA.

* Sarah Cutshall (University of Pittsburgh, Role: Advisor) 2020-2021
Research topic: Outreach project focused on erosion of permafrost landscapes.
Current position: Outreach Coordinator, Science Systems and Applications, Inc., USA.

* Ian Pamerleau (University of Pittsburgh, Role: Advisor) 2019-2021
Research topic: Analysis of floodplains in Arctic areas.
Awards:
-Brackenridge Fellowship (2020).
Current position: Ph.D. student, Purdue University, USA.

* Mirabel Raid (University of Pittsburgh, Role: Advisor) 2016-2020
Research topic: Analysis of topological symmetry in biological networks.
Awards:
-Brackenridge Fellowship (2018).
Current position: Ph.D. student, Georgia Institution of Technology, USA.

* Harisa Martinos (First Experience in Research Program [U. of Pittsburgh], Role: Advisor) 2017
Research topic: Correlation between topographic metrics and damage to surface structures.
Current position: Landscape designer, EvolveEA, USA.

* Shi Yuchen (First Experience in Research Program [U. of Pittsburgh], Role: Advisor) 2017
Research topic: Correlation between topographic metrics and damage to surface structures.

* Yoav Gross (Ben Gurion University, Role: Co-Advisor with Dr. Liran Goren) 2015-2016
Research topic: Exploring controls on the relations between river-length and drainage area (Hack's law).
Current position: Graduate student, Exter College, Oxford, UK.

Committee Member for the Following Graduate Students

Current:

Melissa Griffore- Ph.D. Student (University of Pittsburgh).

Chloe Grover - Ph.D. Student (University of Pittsburgh).
Rebecca Mattecha - Ph.D. Student (University of Pittsburgh).
Ben McKeeby - Ph.D. Student (University of Pittsburgh).
Ian Flynn - Ph.D. Student (University of Pittsburgh).
Marry Braza - Ph.D. Student (University of Pittsburgh).
Samuel Mark - Ph.D. Student (University of Pittsburgh).
Kobi Havoosha - M.Sc. Student (Ben Gurion University, Israel).
Omri Porat - M.Sc. Student (Ben Gurion University, Israel).

Former:

Marja Coperland - Ph.D. Student (University of Pittsburgh).
Julio Caineta - Ph.D. Student (University of Pittsburgh).
Christine Simurda - Ph.D. Student (University of Pittsburgh).
Victoria Buford - Ph.D. Student (University of Pittsburgh).
Suryodoy Ghoshal - Ph.D. Student (University of Pittsburgh).
Rebecca Tisherman - Ph.D. Student (University of Pittsburgh).
Arielle Woods - Ph.D. Student (University of Pittsburgh).
James Thompson - Ph.D. Student (University of Pittsburgh).
Christine Simurda - Ph.D. Student (University of Pittsburgh).
Nathan Beauchamp - M.Sc. Student (University of Pittsburgh).
Joshua Olsen - M.Sc. Student (University of Pittsburgh).
Sarah Cook - M.Sc. Student (University of Pittsburgh).

Service and Synergetic Activities

Panelist:

- NSF-Arctic System Science (ARCSS).
- NSF-Arctic Natural Science (ANS).
- NSF-Geomorphology and Land-use Dynamics (GLD).

Proposal Reviewer:

- NSF-Arctic System Science (ARCSS).
- NSF-Arctic Natural Science (ANS).
- NSF-CAREER.
- NSF-EAR postdoctoral fellowship.
- NSF-Hydrologic Sciences.
- NSF-Geomorphology and Landscape Dynamics (GLD).

– NSF-Marine Geology and Geophysics (OCE).

– NSF-Tectonics.

– New Generation of Polar Researchers Leadership (NGPR).

– Israel Science Foundation (ISF).

– University of Pittsburgh-CRDF.

Journal Reviewer:

– Catena.

– Earth's Future.

– Earth Surface Processes and Landforms.

– Earth and Planetary Science Letters.

– Engineering Geology.

– Geology.

– Geophysical Research Letters.

– Geosphere.

– Journal of Geophysical Research: Biogeosciences.

– Journal of Geophysical Research: Earth Surface.

– Journal of Geophysical Research: Solid Earth.

– Journal of Arid Environments.

– Quaternary research.

– Tectonics.

– Water Resources Research.

Service for the American Geophysical Union (AGU):

– Chair of the committee for judging and ranking activities for the Outstanding Student Presentation Award (OSPA committee) competition in the EPSP section of the American Geophysical Union. 2022-present

– Member of the *Executive Committee for Earth and Planetary Surface Processes Section* (OSPA committee) at AGU. 2019-present

– Served as a judge for the Outstanding Student Presentation Award (OSPA), competition in the American Geophysical Union conferences in the years 2016, 2017, 2018, 2019, 2020.

– Served as a coordinator of judging and ranking activities for the Outstanding Student Presentation Award (OSPA) competition in the American Geophysical Union conferences in 2018, 2019, 2020, 2021.

National Workgroups:

– Competitively selected for a workgroup focused on Coupling of Tectonic and Surface Processes (CTSP, CSDMS), Boulder, CO, 2018.

– Competitively selected for an international workshop of New Generation of Polar Researchers Leadership (NGPR) Symposium, CA, 2015.

– A Lead/Co-Lead workgroup of the Permafrost Carbon Network (PCN), AZ, 2015.

Science and Community Outreach:

– Associate director of the Water Collaboratory at the University of Pittsburgh; A science and outreach collaboratory dedicated for water sustainability issues in the greater pittsburgh area, PA, 2017-present.

– Let's Talk About Water. Event sponsored by the Pittsburgh Collaboratory for Water Research, Education and Outreach. Designed to launch interactive conversations about regional water challenges. Event co-organized by Collaboratory faculty (Drs. Thomas, Elliot, Bain, Shelef). 2018.

– Community Green Infrastructure Meeting. Event sponsored by the Pittsburgh Collaboratory for Water Research, Education and Outreach. Designed to induce conversation within the local community regarding challenges associated with green infrastructure. Event co-organized by Collaboratory faculty (Drs. Thomas, Elliot, Bain, Shelef). 2018.

– Member of AGU's Thriving Earth Exchange (TEX) team for the Connersville flooding project, PA, 2017-2019.

– Community Water Quality Meeting. Event sponsored by the Pittsburgh Collaboratory for Water Research, Education and Outreach. Designed to induce conversation within the local community regarding challenges associated with water quality. Event co-organized by Collaboratory faculty (Drs. Thomas, Elliot, Bain, Shelef). 2019.

– Community Flooding Meeting. Event sponsored by the Pittsburgh Collaboratory for Water Research, Education and Outreach. Designed to induce conversation within the local community regarding challenges associated with water quality. Event co-organized by Collaboratory faculty (Drs. Thomas, Elliot, Bain, Shelef). 2019.

– Panel member for a Capstone Project course for the Department of Ethics, History and Public Policy at Carnegie Mellon University focused on the Social Implications of Landslides. 2018.

– Member of the IRISE (Impactful Resilient Infrastructure Science and Engineering) Advisory Group for Capacity Building Seminar Series focused on Landslides in Western PA. 2020.

Service at the Department of Geology and Environmental Science:

– Member of the Departmental search committee for new faculty. 2021-present

– Lead of mentoring team for international students in the GES department. 2021-present

– Member of the Departmental Diversity Equity and Inclusion Committee. 2017-present

– Member of the Departmental Graduate Committee. 2016-present

– Member of the Departmental Mellon Award committee. 2020-2022

– Member of the Departmental search committee for faculty in hydrology. 2019

– Lead, Departmental Colloquium series. 2018

– Member of the Henry Leighton Memorial Graduate Award Committee. 2017
– Member of the Dr. J. Frederick and Ann Sarg Research Award Committee. 2017
– Helped spearhead the development of a hiring strategy plan for the department. 2017
– Member of the Departmental Search Committee for a visiting lecturer position. 2017