



Exponent®
Engineering & Scientific Consulting

Bill Medwedeff, Ph.D.

Scientist | Civil Engineering

Oakland

+1-510-907-5850 tel | bmedwedeff@exponent.com

Professional Profile

Dr. Medwedeff specializes in geomorphology, near-surface geophysics, landslide hazard analysis, geospatial analytics, and tectonics. He has experience characterizing subsurface conditions of soils and weathered rock.

Dr. Medwedeff also has experience with analysis and interpretation of satellite imagery, spectral data, and digital elevation data including LiDAR and photogrammetry-derived products. He uses these remote sensing tools for hazard mapping and evaluation of regional slope stability following earthquakes and/or large rainstorms. Dr. Medwedeff has significant fieldwork experience in remote areas, including post-earthquake hazard reconnaissance, geophysical surveys, and rock mass characterization. He provides technical expertise on the implementation of statistical analyses and development of numerical models for regional slope stability.

Prior to joining Exponent, Dr. Medwedeff earned his Ph.D. from the University of Michigan. His graduate research focused on understanding the controls on regional patterns in rock weathering and rock strength in central Nepal. In addressing this research, Dr. Medwedeff applied field-based techniques including compressional and surface wave seismic surveys, rockmass characterization with the Geological Strength Index (GSI) and Hoek and Brown Criterion, and Schmidt Hammer measurements. He also analyzed landslide size statistics and developed slope stability inverse modelling approaches to investigate how variations in shallow rock strength are reflected in regional landslide distributions. Dr. Medwedeff's research considered how variations in the thickness of bedrock weathering profiles reflect erosion rates and landscape evolution over geologic timescales. This aspect of his research involved the characterization of fault slip rates and erosion rates with (U-Th)/He thermochronology and inverse thermal modeling in central Nepal.

While at the University of Michigan Dr. Medwedeff was awarded a National Science Foundation Graduate Research Fellowship. He also served as a graduate student instructor for four undergraduate courses over five semesters, including geographic information systems (GIS), applied geophysics, structural geology, and a structural mapping course at University of Michigan's field camp in Jackson Wyoming.

Academic Credentials & Professional Honors

Ph.D., Earth and Environmental Sciences, University of Michigan, Ann Arbor, 2022

B.Sc., Geophysics, University of Washington, 2015

National Science Foundation Graduate Research Fellowship Program Award, 2018

Prior Experience

Undergraduate Intern, University of Washington Applied Physics Laboratory, 2015

Professional Affiliations

American Geophysical Union, Geological Society of America

Publications

Medwedeff, W.G.; Clark, M.K.; Zekkos, D.; West, A.J.; Chamlagain, D. (2022) Near-Surface Geomechanical Properties and Weathering Characteristics Across a Tectonic and Climatic Gradient in the Central Nepal Himalaya. *JGR Earth Surface*, 127(2), e2021JF006240.

Stanley, T.A.; Kirschbaum, D.B.; Benz, G.; Emberson, R.A.; Amatya, P.M.; Medwedeff, W.G.; Clark, M.K. (2021) Data-driven landslide nowcasting at the global scale. *Frontiers in Earth Science*, 9, Article 640043.

Medwedeff, W.G.; Clark, M.K.; Zekkos, D.; West, A.J. (2020) Characteristic landslide distributions: an investigation of landscape controls on landslide size. *EPSL*, 539, 116203

Zekkos, D.; Manousakis, J.; Athanasopoulos-Zekkos, A.; Clark, M.K.; Knoper, L.; Massey, C.; Archibald, G.; Greenwood, W.; Hemphill-Haley, M.; Rathje, E.; Litchfield, N.; Medwedeff, W.G.; Van Dissen, R.J.; Kearse, J.; Ries, W.; Villamor, P.; Langridge, R.M. (2018) Structure-from-motion based 3D mapping of landslides and fault rupture sites during 2016 Kaikoura earthquake reconnaissance. *Proc. 11th US National Conf. on Earthquake Eng., Integrating Science, Eng. Policy*

Zekkos, D.; Clark, M.K.; Willis, M.; Athanasopoulos-Zekkos, A.; Manousakis, J.; Knoper, L.; Stahl, T.; Massey, C.; Archibald, C.; Greenwood, W.; Medwedeff, W. (2018) 3D models of the Leader Valley using satellite & UAV imagery following the 2016 Kaikoura earthquake. *Proc. 11th US National Conf. on Earthquake Eng., Integrating Science, Eng. Policy*

Zekkos, D.; Clark, M.K.; Whitworth, M.; Greenwood, W.; West, A.J.; Roback, K.; Li, G.; Chamlagain, D.; Manousakis, J.; Quackenbush, P.; Medwedeff, W.G.; Lynch, J. (2017) Observations of landslides caused by the April 2015 Gorkha, Nepal, earthquake based on land, UAV, and satellite reconnaissance. *Earthquake Spectra*, 33(1), 95-114.

Zekkos, D.; Clark, M.K.; Cowell, K.; Medwedeff, W.G.; Manousakis, J.; Saroglou, H.; Tsiambaos, G. (2017) Satellite and UAV-enabled mapping of landslides caused by the November 17th 2015 Mw 6.5 Lefkada Earthquake. *Proc. 19th Int. Conf. on Soil Mechanics and Geotech. Eng.* 17-22

Stahl, T.; Clark, M.K.; Zekkos, D.; Athanasopoulos-Zekkos, A.; Willis, M.; Medwedeff, W.; Knoper, L.; Townsend, K.; Jin, J. (2017) Earthquake science in resilient societies. *Tectonics*, 36(4), 749-753.

Medwedeff, W.G. & Roe, G. (2017) Trends and variability in the global dataset of glacial mass balance. *Climate Dynamics*, 48(9), 3085-3097.

Presentations

Clark, M.K.; Medwedeff, W.G.; Hille, M.; Zekkos, D.; West, A.J.; Atwood, A.; Chamlagain, D. (2021) Tectonics climate coupling in the Himalaya from the perspective of extreme events. *AGU Fall Meeting*.

Medwedeff, W.G. (2020) What controls near-surface bedrock strength in a tectonically active environment? Lessons from geotechnical observations in central Nepal. *USGS Landslide Hazards Program Seminar Invited Talk*

Medwedeff, W.G.; Clark, M.K.; Zekkos, D.; Allstadt, K.; Mirus, B.; West, A.J.; Atwood, A.; Chamlagain, D.

(2020) How Do Near-Surface Strength Characteristics Vary Over Landscape Scales? A Case Study Using Geotechnical Field Methods and a Back-Analysis of Earthquake Triggered Landslides. AGU Fall Meeting

West, A.J.; Atwood, A.; Zekkos, D.; Clark, M.K.; Medwedeff, W.G.; Chamlagain, D.; Budhathoki, S. (2020) Mountain building and critical zone development: the interplay of rock fracturing and mineral weathering in the rapidly exhuming High Himalaya, central Nepal. AGU Fall Meeting

Medwedeff, W.G.; Clark, M.K.; Zekkos, D.; West, A.J. (2019) Seismic characterization of the Critical Zone in the Nepal Himalaya: a regional perspective. AGU Fall Meeting

Clark, M.K.; Zekkos, D.; West, A.J.; Medwedeff, W.G.; Knoper, L.; Atwood, A.; Willis, M.J.; Chamlagain, D.; Manousakis, J.; Massey, C. (2019) Emerging tools and techniques for taking advantage of remote sensing imagery to understand the landslide hazard cascade. AGU Fall Meeting

Medwedeff, W.G.; Clark, M.K.; Zekkos, D.; West, A.J. (2018) Scale dependent topographic control of landslide frequency-size statistics. AGU Fall Meeting

Murray, K.E.; Clark, M.K.; Niemi, N.A.; Quackenbush, P.; West, A.J.; Medwedeff, W.G.; Chamlagain, D. (2018) Focused pulse of rapid erosion in central Nepal related to Himalayan fault motion. AGU Fall Meeting.

Medwedeff, W.G. & Clark, M.K. (2017) Landslides are scale specific. GSA Annual Meeting

Medwedeff, W.G. & Roe, G. (2015) Global Trends and Variability in the Mass Balance of Mountain and Valley Glaciers. AGU Fall Meeting

Research Grants

National Science Foundation Graduate Research Internship Award (2020)

National Science Foundation Graduate Research Fellowship Program Award (2018)

University of Michigan, Department of Earth and Environmental Sciences, Turner Research Grant (2017, 2018, 2019)

University of Michigan Rackham Graduate Student Research Grant (2017)

University of Michigan Department of Earth and Environmental Sciences, Chester B. Slawson Memorial Fellowship (2016)

Peer Reviews

Earth and Planetary Science Letters