

EL HACHEMI BOUALI, PH.D.

ASSISTANT PROFESSOR OF GEOSCIENCES, NEVADA STATE COLLEGE

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Henderson, NV 89002

EDUCATION

- PhD** Michigan Technological University, Geology August 2018
Dissertation: Analyzing the life-cycle of unstable slopes using applied remote sensing within an asset management framework
Committee: Thomas Oommen, Ph.D. (chair); Stanley Vitton, Ph.D.; Rüdiger Escobar-Wolf, Ph.D.; Donald Atwood, Ph.D.
- MS** Western Michigan University, Geoscience December 2013
Thesis: Utilizing persistent scatterer interferometry to investigate the nature and factors controlling Nile Delta subsidence
Committee: Mohamed Sultan, Ph.D. (chair); William Sauck, Ph.D.; Robert Gillespie, Ph.D.; Richard Becker, Ph.D.
- BS** Western Michigan University, Geophysics April 2011
Graduated Cum Laude, Lee Honors College
Minor in Mathematics and Astronomy
Honors Thesis: Correlation between freeze/thaw cycles and stability of Lake Michigan bluffs at Miami Park, Van Buren County, Michigan
Committee: Ronald Chase, Ph.D. (chair); Alan Kehew, Ph.D.; Duane Hampton, Ph.D.
- AS** Kalamazoo Valley Community College May 2007

POSITIONS

- Assistant Professor of Geosciences**
Nevada State College, Henderson, NV 2020 to present
Department of Physical and Life Sciences
- Thomas McKenna Meredith '48 Postdoctoral Fellow in Environmental Science**
Trinity College, Hartford, CT 2018 to 2020
Environmental Science Program
- Independent Remote Sensing Contractor**
Clients: Michigan Technological University and World Bank 2018
Project: Critical Slope Monitoring using InSAR and COSI-Corr in Southeast Asia

NASA Earth and Space Science Fellow Michigan Technological University, Houghton, MI Department of Geological & Mining Engineering & Sciences	2016 to 2018
Geological Mapping Technician National Parks Service, GeoCorps (2015), and AmeriCorps (2016) Pictured Rocks National Lakeshore	2015 and 2016
Graduate Research Assistant Michigan Technological University, Houghton, MI Department of Geological & Mining Engineering & Sciences	2014 to 2016
Graduate Teaching and Research Assistant Western Michigan University, Kalamazoo, MI Department of Geosciences	2011 to 2013

COURSES TAUGHT

Department of Physical and Life Sciences, Nevada State College
GEOL 101 Exploring Planet Earth (lecture and lab)

Environmental Science Program, Trinity College
ENVS 112 Introduction to Earth Science (lecture)
ENVS 115 Natural Disasters (lecture)
ENVS 310 Environmental Geophysics (lecture)
ENVS 399 Independent Study
ENVS 425 Research in Environmental Science Lab
ENVS 466 Teaching Assistantship
ENVS 497 Honors Research

Department of Geological Sciences, Western Michigan University
GEOL 1000 Earth Studies (lab)
GEOS 1310 Historical Geology (lab)
GEOS 4300 Structural Geology (lab)
GEOS 4380 Field Studies in Geology
GEOS 4390 Geological Mapping
GEOS 5600 Introduction to Geophysics (lab)

ACADEMIC ADVISING AND COMMITTEES

Committee Chair for Chuck Sweeney – B.S. Environmental Science with Honors, Trinity College. Thesis: Using ground penetrating radar to map subsurface glacial delta deposits. Graduated May 2020.

Committee Member for Nicole E. Towner – B.S. Environmental Science with Honors, Trinity College. Thesis: Macroscopic charcoal records from soils in western Iowa. Graduated May 2019.

AWARDS AND HONORS (\$131,815)

Undergraduate Student Research Awards and Scholarship

2019 Chuck Sweeney, Summer Research Program, Trinity College (\$3,500)

External Fellowships, Grants, and Awards

2018 U.S. Society on Dams Scholarship: 1st Place Finalist (\$8,000)

2016-2018 NASA Earth and Space Science Fellowship (\$75,000)

2016 Segal AmeriCorps Education Award (\$1,515)

2016 Richard W. and June T. Lemke Scholarship, AEG Foundation (\$300)

2015-2016 Michigan Space Grant Consortium Graduate Fellowship (\$10,000)

2015 Travel Grant, GSA North-Central Section (\$300)

2014 Platinum Corporate Sponsor Award, AEG Foundation (\$300)

Academic Awards

2018-2019 Community Learning Faculty Fellow, Trinity College (\$1,000)

2018 Dean's Award for Outstanding Scholarship, MTU

2014, 2015, 2016 Travel Grant, MTU Graduate Student Government (\$900)

2013 W. David Kuenzi Memorial Award, WMU Department of Geosciences

2011, 2012 WMU Department of Geosciences' Appreciation Scholarship

2011 Undergraduate Presidential Scholar in Geosciences, WMU

2011 Senior Honor Award in Geophysics, WMU Department of Geosciences

2011 Distinguished Student Service Award, WMU Department of Geosciences

2010 L. Schmaltz Undergraduate Scholarship in Geology, WMU Dept. of Geosciences

2007-2010 C.L. Remyse Scholarship, Kalamazoo Community Foundation (\$30,000)

2007 Transfer Academic Scholarship, KVCC and WMU (\$1,000)

PUBLICATIONS

*Undergraduate student

Peer-Reviewed Publications

VanderMeer SM, Kehew AE, Sauck WA, Gillespie R, and **Bouali EH** (in preparation) Buried bedrock valleys revealed in Michigan's central Upper Peninsula using HVSR passive seismic method.

Rajaneesh A, Logesh N, Vishnu CL, **Bouali EH**, Oommen T, Midhuna N, Sajinkumar KS (submitted) Monitoring and mapping of shallow landslides in tropical environment using persistent scatterer interferometry.

Bouali EH and Sweeney C* (submitted) Collapsed and non-collapsed ice-marginal glaciodeltaic morphosequence structure mapped with ground penetrating radar in central Connecticut.

- Pooja B, Oommen T, Sajinkumar KS, Nair AG, Rajaneesh A, Aswathi J, **Bouali EH**, Thrivikramji KP (submitted) Applying PSInSAR and modelling deformation at an airport property—a strategic transportation hub.
- Aswathi J, Sajinkumar KS, Rajaneesh A, Oommen T, **Bouali EH**, Binojkumar RB, Rani VR, and Thrivikramji KP (submitted) Furthering the precision of RUSLE soil erosion with PSInSAR data in a tropical river basin, South India: An innovative model.
- Sajinkumar KS, Bincy HS, **Bouali EH**, Oommen T, Vishnu CL, Anilkumar Y, Thrivikramji KP, and Keerthy S (2020) Picturing beach erosion and deposition trends using PSInSAR: An example from the non-barred southern west coast of India. *Wetlands Ecology and Management*, <https://doi.org/10.1007/s11273-020-09706-3>.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2019) Evidence of landslide activity outside previously-mapped zones as measured using GPS, optical, and SAR data between 2007 and 2017: A case study in the Portuguese Bend landslide complex, California. *Remote Sensing*, 11(8):937. <https://doi.org/10.3390/rs11080937>.
- DePrekel K*, **Bouali EH**, and Oommen T (2018) Monitoring the impact of ground water pumping on infrastructure using geographic information system (GIS) and persistent scatterer interferometry (PSI). *Infrastructures*, 3(4):57. <https://doi.org/10.3390/infrastructures3040057>.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2018) Mapping of slow landslides on the Palos Verdes Peninsula using the California landslide inventory and persistent scatterer interferometry. *Landslides*, 15(3):439-452. <https://doi.org/10.1007/s10346-017-0882-z>.
- Bouali EH**, Oommen T, Vitton S, Escobar-Wolf R, and Brooks C (2017) Rockfall Hazard Rating System: Benefits of utilizing remote sensing. *Environmental and Engineering Geoscience*, 23(3):165-177. <https://doi.org/10.2113/gseegeosci.23.3.165>.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2016) Interferometric stacking toward geohazard identification and geotechnical asset monitoring. *Infrastructure Systems*, 22(2):05016001. [https://doi.org/10.1061/\(ASCE\)IS.1943-555X.0000281](https://doi.org/10.1061/(ASCE)IS.1943-555X.0000281).

Conference Proceedings and Papers

- Bouali EH**, Oommen T, and Sajinkumar KS (2018) Monitoring India's dams from space: A cost-effective approach using Sentinel-1 radar images. International Dam Safety Conference 2018, Thiruvananthapuram, Kerala, India.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2017) Structure mapping through spatial and temporal deformation monitoring using persistent scatterer interferometry and geographic information systems. *Geotechnical Frontiers 2017*, GSP 278:509-519. <https://doi.org/10.1061/9780784480458.052>.

Book Chapters, Technical Reports, and Articles

- Oommen T, Escobar-Wolf R, and **Bouali EH** (2019) Proactive monitoring and assessment of critical slopes using remote sensing in the transport sector, south Asia. World Bank, Contract #718842, 73 p.

- Bouali EH** (2018) Numerical analysis of embankment and berm settlement based on InSAR remote sensing measurements. *USSD Dams & Levees: Bulletin of the United States Society on Dams*, Summer 2018, 175:41-43
- Oommen T, **Bouali EH**, and Escobar-Wolf R (2018) New paradigm in geotechnical performance monitoring using remote sensing. In: Ilampaturhi K and Robinson RG (eds.) *Geotechnical Design and Practice: Selected Topics*. Springer Verlag, Singapore, 195-201. https://doi.org/10.1007/978-981-13-0505-4_17.
- Escobar-Wolf R, **Bouali EH**, and Oommen T (2016) Risk Assessment. In: Bobrowsky PT and Marker B (eds.) *Earth Science Series Encyclopedia of Engineering Geology*. Springer International Publishing AG Switzerland, 1-4.
- Escobar-Wolf R, **Bouali EH**, Oommen T, Dobson R, Vitton S, Brooks C, and Lautala P (2016) Candidate remote sensing techniques for the different transportation environments, requirements, platforms, and optimal data fusion methods for assessing the state of geotechnical assets. Michigan Technological University, USDOT Cooperative Agreement No. RITARS-14-H-MTU, 152 p.
- Escobar-Wolf R, **Bouali EH**, Oommen T, Dobson R, Vitton S, Brooks C, and Lautala P (2015) Final Report: Sustainable geotechnical asset management along the transportation infrastructure environment using remote sensing. Michigan Technological University, USDOT Cooperative Agreement No. RITARS-14-H-MTU, 137 p. <https://rosap.nrl.bts.gov/view/dot/38809>.
- Bouali EH**, Oommen T, and Escobar-Wolf (2015) Ground feature monitoring using satellite imagery. *ASCE Geostrata*, 19(4):52-57.

INVITED SEMINAR TALKS

- Bouali EH** (2020) A geotechnical and remote sensing approach to monitor rock slope stability within a railroad corridor near Caliente, Nevada. AEG Southern Nevada Chapter, 10 November, Las Vegas, NV [virtual].
- Bouali EH** (2020) Remote sensing and geophysical techniques for shallow earth exploration. Environmental and Resource Science Colloquium, Nevada State College, 17 September, Henderson, NV [virtual].
- Bouali EH** (2020) Introduction to plate tectonics. Piedmont Virginia Community College, 27 February, Charlottesville, VA.
- Bouali EH** (2020) Wildfires. Nevada State College, 11 February, Henderson, NV.
- Bouali EH** (2020) Surface processes and environmental change: Applications combining remote sensing, near-surface geophysics, and traditional fieldwork. SUNY Fredonia, 31 January, Fredonia, NY.

Bouali EH (2020) Natural hazard lifecycle modeling: A long-term, multi-sensor and geophysical approach to studying the impacts of earth surface processes. University of Alaska Anchorage, 21 January, Anchorage, AK.

Bouali EH (2019) Advantages and limitations of remote sensing for landslide detection, mapping, and (ultimately) prediction. Central Connecticut State University, 1 November, New Britain, CT.

Bouali EH (2018) Monitoring unstable slopes using remote sensing and geodetic techniques for sustainable asset management. Thomas McKenna Meredith '48 Lecture in Environmental Science, Trinity College, 19 October, Hartford, CT.

CONFERENCE PRESENTATIONS (PAST 5 YEARS)

[†]High school student

*Undergraduate student

Oommen T, **Bouali EH**, Sajinkumar KS, Corcoran MK, and Dunbar JB (2021) Using radar remote sensing from space to monitor dams. Geo-Extreme 2021: Geotechnical Engineering for Extreme Events, 15-18 August, Savannah, GA.

Bouali EH and Sweeney C* (2020) Ice-marginal deltaic deposits of the Cromwell delta in central Connecticut mapped using ground penetrating radar. [Poster] GSA 2020 Connects Online, 26-30 October, Virtual Meeting.

Bouali EH and Sweeney C* (2020) Ice-marginal deltaic deposits of the Cromwell delta in central Connecticut mapped using ground penetrating radar. [Abstract] GSA Joint 69th Annual Southeastern / 55th Annual Northeastern Section Meeting, 20-22 March, Reston, VA. (Meeting canceled due to COVID-19 pandemic)

Radulescu A[†] and **Bouali EH** (2020) Spatiotemporal mapping and statistical analysis of native, endemic, and invasive floras using vegetation index data from multispectral optical imagery in the Galapagos islands. 72nd Annual Connecticut Science & Engineering Fair, Quinnipiac University, 9-14 March, Hamden, CT.

Sweeney C* and **Bouali EH** (2019) Using ground penetrating radar to map subsurface glacial delta deposits. [Poster] 15th Annual Summer Research Symposium, Trinity College, 24 September, Hartford, CT.

Bouali EH, Oommen T, and Escobar-Wolf R (2018) Landslide mapping using GPS, optical, and radar data: A case study in the Portuguese Bend Landslide Complex, California between 2007 and 2017. AGU Annual Meeting, 10-14 December, Washington, D.C.

Bouali EH, Oommen T, and Escobar-Wolf R (2018) Landslide monitoring at three orders of magnitude: PSI, COSI-Corr, and GPS measurements at the Portuguese Bend Landslide complex in southern California. Joint 2018 AEG Annual Meeting and XIII IAEG Congress, 15-23 September, San Francisco, CA.

- Bouali EH**, Oommen T, Sajinkumar KS, and Escobar-Wolf R (2018) Satellite InSAR as an initial health assessment tool for dams and reservoirs. USSD Annual Conference and Exhibition, 30 April-4 May, Miami, FL.
- Bouali EH** (2018) Numerical analysis of embankment and berm settlement based on InSAR remote sensing measurements. USSD Annual Conference and Exhibition, 30 April-4 May, Miami, FL.
- DePrekel K*, **Bouali EH**, and Oommen T (2018) Monitoring the impact of ground water pumping on infrastructure using geographic information system (GIS) and persistent scatterer interferometry (PSI). [Poster] Undergraduate Research Symposium, 23 March, Houghton, MI.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2017) Landslide life-cycle monitoring and failure prediction using satellite remote sensing. AGU Annual Meeting, 11-15 December, New Orleans, LA.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2017) Slow landslide identification using InSAR to update the California landslide inventory on the Palos Verdes Peninsula. GSA Annual Meeting, 22-25 October, Seattle, WA.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2017) Monitoring the Casitas Dam in Ventura County, California with satellite InSAR. AEG Annual Meeting, 10-16 September, Colorado Springs, CO.
- Bouali EH**, Oommen T, Escobar-Wolf R, Brooks C, and Lautala P (2017) Evaluating the integrity of railway corridor using remote sensing. RIVIT Conference, 20-21 June, Urbana, IL.
- Bouali EH** and Oommen T (2017) Utilizing PSInSAR to monitor transportation asset conditions to maintain mobility efficiency. [Poster] Michigan Tech Mobility Summit, 20 April, Houghton, MI.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2016) Comparing the California landslide inventory to ground motion detected by the COSMO-SkyMed satellite across the Palos Verdes Peninsula. AEG Annual Meeting, 18-24 September, Kona, HI.
- Bouali EH**, Oommen T, Vitton S, Escobar-Wolf R, and Brooks C (2016) Rockfall hazard analysis using satellite, UAV, and field data: A comparison of techniques and RHRS results. AEG Annual Meeting, 18-24 September, Kona, HI.
- Bouali EH** (2016) Monitoring slope instability and ground deformation across the Palos Verdes Peninsula with COSMO-SkyMed satellite radar imagery. Graduate Research Colloquium, 24-25 February, Houghton, MI.
- Oommen T, **Bouali EH**, and Escobar-Wolf R (2016) Interferometric synthetic aperture radar: A promising new tool for network-wide transportation infrastructure monitoring. Lecture 3: Application of InSAR for Geotechnical Asset Management. TRB Annual Meeting, Workshop 879, 10-14 January, Washington, D.C.
- Bouali EH**, Oommen T, and Escobar-Wolf R (2015) A multi-sensor approach to monitor slope displacement. AGU Annual Meeting, 14-18 December, San Francisco, CA.

Oommen T, Schaefer L, and **Bouali EH** (2015) Integrated remote sensing and numerical modeling for geohazard characterization and monitoring. ILP Celebrating 35 Years, 21-23 September, Potsdam, Germany.

Bouali EH, Oommen T, and Escobar-Wolf R (2015) Can we extract information regarding transportation asset condition from satellite-based radar interferometric data? AEG Annual Meeting, 19-26 September, Pittsburgh, PA.

RESEARCH INTERESTS AND TECHNICAL SKILLS

Research Interests: Near-Surface Geophysics, Natural Hazards, Remote Sensing, Applied Geology and Geologic Mapping, Geomorphology, Societal Impacts and Critical Zone Processes, Change Detection using Long-Term Monitoring Techniques, and Geoscience Education/Academia

Field Instruments: Sensors & Software PulseEkko Pro Ground Penetrating Radar System (with 50, 100, and 250 MHz antenna transmitter/receiver); GSSI SIR 10A+ Ground Penetrating Radar System (with 100, 300, and 500 MHz antenna transmitter/receiver); Bison 2390 Resistivity Meter; Syscal Junior Pro Resistivity Meter; Syscal R2 Resistivity Meter; Soiltest ER-2 Electrical Resistivity Meter; Geonics EM-31 MK-2 Conductivity Meter; Lacoste-Romberg Model G Gravimetry; Tromino Passive Seismic Unit (TZ3-0021/01-14); Geometrics RX-24 Seismic System (with up to 48 vertical/horizontal geophones); Geometrics G-858 Cesium Vapor Magnetometer

Computer Software: ArcGIS, ENVI, ENVI + SARscape module, ENVI + COSI-Corr module, Rocscience, Reflex GPR Post-Processing Software, GSSI RADAN 6 GPR Post-Processing Software, Prosys II and ProsysView, Electre Pro, Surfer Grapher, Google Earth Pro, Adobe Illustrator, Inkscape, and Microsoft Office Suite

PROFESSIONAL DEVELOPMENT

- 2020-2021 ACUE Course in Effective Online Teaching Practices, Nevada State College, 11 August 2020 – May 2021, Henderson, Nevada.
- 2020 New Faculty Orientation, Nevada State College, 12-13 August, Henderson, Nevada.
- 2019 Understanding our Students in Teaching and Advising Workshop, Trinity College, 14 May, Hartford, Connecticut.
- 2018 New Faculty Orientation, Trinity College, 27-28 August, Hartford, Connecticut.
- 2017 NextProf Science Future Faculty Workshop, University of Michigan, 2-5 May, Ann Arbor, Michigan.

PROFESSIONAL SERVICE

- 2019 Joined Remote Sensing (ISSN 2072-4292) Reviewer Board
- 2017 Technical Session Moderator. AEG Annual Meeting, TS #22: InSAR Applications for Geology and Geological Engineering.
- 2017 Panel Member. RIVIT Conference, UAS Technology Challenges & Opportunity.

2016 Technical Session Moderator. AEG Annual Meeting, TS #12: Application of Geophysics to Geotechnical Investigations, TS #13: Geophysics and Remote Sensing in Engineering Geology: Case Studies and Advances using Geophysics, Drones and Satellites.

Journal Peer-Reviewer (37 articles)

AIMS Geoscience (1); Applied Sciences (7); Forests (1); ISPRS International Journal of Geo-Information (1); Journal of the Optical Society of America (1); Remote Sensing (21); Sustainability (2); Water (3)

LEADERSHIP AND VOLUNTEER EXPERIENCE

2019-2020	Health and Wellness Committee, Trinity College
2017	Student Volunteer, AEG Annual Meeting in Colorado Springs, CO
2016	Student Volunteer, AEG Annual Meeting in Kona, HI
2015	Student Volunteer, AEG Annual Meeting in Pittsburgh, PA
2011-2013	Graduate Member of Academic Integrity Committee, WMU
2010-2011	Undergraduate Member of Academic Integrity Committee, WMU
2010-2011	Geology Club President, WMU Department of Geosciences
2009-2010	Student Volunteer, Michigan Geological Repository for Research & Education

PROFESSIONAL AFFILIATIONS (CURRENT)

American Institute of Professional Geologists
Association of Environmental & Engineering Geologists
Center for Inquiry
Geological Society of America
Geological Society of Connecticut

SOCIAL MEDIA CONTACTS

Research Gate https://www.researchgate.net/profile/El_Hachemi_Bouali
LinkedIn <https://www.linkedin.com/in/el-hachemi-bouali-60b385149/>
Twitter @BoualiHachemi
ORCID iD <https://orcid.org/0000-0002-4663-3191>
Publons <https://publons.com/researcher/1676496/el-hachemi-bouali/peer-review/>
Website <https://eybouali.wixsite.com/main>