Nishkarsha Dawadi

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EDUCATION

Ph.D. in Civil and Environmental Engineering (Geotechnical) — Aug 2021 – Present
Utah State University — Logan, Utah, USA
Dissertation: *Multi-Dimensional Site Response Analysis at Downhole Array Sites*
Advisor: Dr. Brady R. Cox | GPA: 4.0/4.0

M.S. in Geotechnical Engineering — April 2020
Tribhuvan University — Kathmandu, Nepal
Thesis: *Support System Design for the Upper Balephi 'A' Tunnel Using 3D Numerical and Conventional Methods*
Graduated with Distinction

B.S. in Civil Engineering — November 2016
Tribhuvan University — Kathmandu, Nepal

RESEARCH SUMMARY

- Research Interests: Geotechnical earthquake engineering; seismic site response; infrastructure resilience; computational geomechanics; multi-dimensional wave propagation; geophysical site characterization; spatial variability and geostatistics.
- Publications: 3 peer-reviewed journal articles published in *Earthquake Spectra*, *Soil Dynamics and Earthquake Engineering*, and *Seismological Research Letters*; 4 refereed conference papers; and 4 published open-access research datasets.
- Technical Reports**:** 6 technical reports from applied geotechnical and industry-sponsored projects.
- Google Scholar: 53 citations
- Specializations:
  - Large-scale 2D/3D site response analysis
  - Numerical modeling and nonlinear analysis (FLAC3D, Seismo-VLAB)
  - Large-scale 3D shear-wave velocity and damping model development
  - Ground motion processing and signal analysis
  - Horizontal-to-Vertical Spectral Ratio (HVSR) measurement and processing
  - Subsurface imaging and site characterization using noninvasive surface-wave methods (MASW and MAM), including work on **3 NQA-1**-compliant nuclear power projects
  - Advanced sensing techniques (e.g., distributed acoustic sensing (DAS), three-component seismometers, direct-push crosshole sensors, etc.)
  - Programming: Python and MATLAB

PEER-REVIEWED JOURNAL ARTICLES

In Preparation:

[J4] **Dawadi, N.**, Cox, B. R. (2026) "*Three-Dimensional Nonlinear Site Response Analyses at the Delaney Park Downhole Array Site*", In Progress.

Published:

[J3] **Dawadi, N.**, Cox, B. R. (2026) "*Effects of Varying Incident Wave Inclination and Azimuthal Angles on Multi-Dimensional Ground Response Analyses at the Delaney Park Downhole Array Site*", Soil Dynamics and Earthquake Engineering. https://doi.org/10.1016/j.soildyn.2026.110630

[J2] **Dawadi, N.**, Mohammadi, K., Hallal, M. M., Cox, B. R. (2026) "*Insights on Numerical Damping Formulations Gained From Calibrating 2D Ground Response Analyses at Downhole Array Sites*", Earthquake Spectra. https://doi.org/10.1002/esp4.70087

[J1] Abbas, A., Cox, B. R., Tran, K. T., Corey, I., **Dawadi, N.** (2023) "*An Open-Access Dataset of Active-source and Passive-wavefield DAS and Nodal Station Measurements at the Newberry Florida Site*" Seismological Research Letters (SSA). https://doi.org/10.1785/0220230216

CONFERENCE PAPERS

[C4] **Dawadi, N.**, Mohammadi, K., Hallal, M. M., Cox, B. R. (2026) "Comparative Assessment of Damping Models for Small-Strain Ground Response Analysis: A Case Study at the Delaney Park Downhole Array Site" Accepted for publication in the proceedings of the 21st International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE), Vienna, Austria. https://doi.org/10.53243/ICSMGE2026-827

[C3] Aimar, M., Abbas, A., **Dawadi, N.**, Cox, B.R., Foti, S. (2026) "In-situ estimation of a pseudo-3D model of shear wave velocity and small strain damping ratio using surface wave testing" Accepted for publication in the proceedings of the 21st International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE), Vienna, Austria. https://doi.org/10.53243/ICSMGE2026-1691

[C2] **Dawadi N.**, Jackson, T. S., Cox, B.R. (2026). "Three-Dimensional Ground Response Analyses at the I-15 Downhole Array Site near Salt Lake City" In Proceedings of Geo-Congress 2026, pp. 504–514, Salt Lake City, USA. https://doi.org/10.1061/9780784486702.049

[C1] **Dawadi, N.**, Hallal, M. M., Cox, B. R. (2024). "*Two-dimensional Ground Response Analyses at the Delaney Park Downhole Array Site*" In Proceedings of the 8th International Conference on Earthquake Geotechnical Engineering, 2024, Osaka, Japan. https://doi.org/10.3208/jgssp.v10.SS-3-01

DATASETS

[D4] Cox, B.R., Jackson, T., **Dawadi, N.**, Cannon, K.(2025). *The I-15 Downhole Array (I15DA): A Database of Non-invasive Site Characterization Data and Aftershock Ground Motions Following the 2020 M5.7 Magna, Utah Earthquake*. DesignSafe-CI. https://doi.org/10.17603/ds2-xt4m-xa77

[D3] Hallal, M.M., Cox, B.R., **Dawadi, N.**, Teague, D. (2025). "Raw Field Measurements from Garner Valley, Borrego Valley, Treasure Island, and Delaney Park Downhole Arrays", in *Comprehensive Noninvasive Subsurface Testing at Four U.S. Borehole Array Sites*. DesignSafe-CI. https://doi.org/10.17603/ds2-yek8-8a25

[D2] Abbas, A., Cox, B.R., **Dawadi, N.**, Jackson, T., Cannon, K. (2024) "*Geotechnical site characterization at the Drainage Farm Site*" DesignSafe-CI. https://doi.org/10.17603/ds2-sx2h-8s20

[D1] Abbas, A., Cox, B., Tran, K., Corey, I., **Dawadi, N.**, Menq, F. (2023) "*Active-source and Passive-wavefield DAS and Nodal Station Measurements at the Newberry Florida Site*" DesignSafe-CI. https://doi.org/10.17603/ds2-50eh-7v93

REPORTS

[R6] Cox, B.R., **Dawadi, N.**, Bhaumik, M., Budge, B. (2026) "Deep Shear Wave Velocity Profiling Using MASW and MAM Surface Wave Methods: Energy Northwest New Nuclear (ENNN) Cascade Advanced Energy Facility (CAEF) Site" Geotechnical Engineering Report COX26-03, Utah State University, August 2026.

[R5] Cox, B.R., **Dawadi, N.**, Cannon, K. (2024) "Deep Shear Wave Velocity Profiling using MASW and MAM Surface Wave Methods at the Palisades NPP Site: Phase II" Geotechnical Engineering Report COX24-05, Utah State University, November 2024.

[R4] Cox, B. R., Abbas, A., **Dawadi, N.** (2024) "Deep Shear Wave Velocity Profiling Using MASW and MAM Surface Wave Methods: Kemmerer Unit 1 Site, Wyoming" Geotechnical Engineering Report COX24-04, Utah State University, August 2024.

[R3] Cox, B.R., **Dawadi, N.**, Cannon, K., Jackson, T. (2024) " Vs30 Seismic Site Classification Using MASW and MAM Surface Wave Methods: SMASH Lab, Utah State University, Logan, Utah" Geotechnical Engineering Report COX24-03, Utah State University, April 2024.

[R2] Cox, B.R., Jackson, T., **Dawadi, N.** (2024) "Calibrating Ground Response Analyses Beneath an Instrumented Bridge using the I-15 Borehole Array and Ground Motions from the 2020 M5.7 Magna Earthquake" MPC 24-517, Mountain-Plains Consortium. https://rosap.ntl.bts.gov/view/dot/74618

[R1] Cox, B.R., **Dawadi, N.**, Abbas, A. (2024) "Deep Shear Wave Velocity Profiling Using MASW and MAM Surface Wave Methods: Palisades NPP Site" Geotechnical Engineering Report COX24-01, Utah State University, February 2024.

TECHNICAL PRESENTATIONS

[P1] **Dawadi N.**, Jackson, T. S., Cox, B.R. (2026) " Three-Dimensional Ground Response Analyses at the I-15 Downhole Array Site near Salt Lake City" Presented at the Geo-Congress 2026, Salt Lake City, Utah, USA.

RESEARCH EXPERIENCE

Graduate Research Assistant Aug 2021 – Present
Utah State University Logan, Utah

Seismic Site Response Analysis:

- Developed and calibrated large-scale 2D/3D numerical site response models at downhole array sites using FLAC3D and Seismo-VLAB.
- Investigated the effects of multi-dimensional wave propagation, incident-wave inclination and azimuth, and numerical damping formulations on seismic site response.
- Developed large-scale 3D shear-wave velocity (Vs) models using geostatistical kriging and spatially distributed HVSR measurements to support multi-dimensional site response analyses.
- Processed earthquake ground motions recorded at downhole arrays to quantify empirical site response and evaluate numerical predictions.

Geophysical Site Characterization:

- Developed deep Vs profiles at downhole array sites using active- and passive-source surface-wave methods (MASW and MAM).
- Collected and processed spatially distributed HVSR measurements to characterize subsurface variability and support development of large-scale 3D Vs models.
- Conducted a large-scale subsurface imaging experiment in Newberry, Florida, using approximately 2 km of distributed acoustic sensing (DAS) cable.

Graduate Student Researcher 2018-2020
Tribhuvan University Kathmandu, Nepal

Rock Tunneling:

- Investigated rock-burst and squeezing potential and evaluated support requirements for a rock tunnel in the Nepal Himalayas.
- Developed 3D finite-element models in GTS-NX to investigate stress distribution and support performance in complex underground excavations.
- Designed the support system for a vertical shaft connected to a hard-rock tunnel and compared 3D numerical predictions with 2D FEM and empirical rock-mass classification methods (RMR and Q-system).

Undergraduate Student Researcher 2017-2018
Tribhuvan University Kathmandu, Nepal

Graduation Project:

- Conducted a pre-feasibility study of the Upper Dordi 'A' Hydropower Project in Nepal

TEACHING EXPERIENCE

Graduate Research Assistant Aug 2021 – Present
Utah State University Logan, Utah

- Instructor, CEE 6340: In-Situ Site Characterization — Delivered course instruction during the lead instructor's absence.
- Guest Lecturer, CEE 6930: Numerical Methods — Delivered a lecture on numerical damping formulations and their application to site response analysis in FLAC3D.

PROFESSIONAL & INDUSTRY EXPERIENCE

Graduate Research Assistant – Industry-Sponsored Projects Aug 2021 – Present
Utah State University Logan, Utah

- Conducted **NQA-1**-compliant MASW/MAM field testing and data processing for deep (~1 km) shear-wave velocity profiling at the Energy Northwest New Nuclear (ENNN) Cascade Advanced Energy Facility (CAEF) Site, Washington.
- Developed deep (~700 m) shear-wave velocity profiles for the Palisades Nuclear Power Plant, Michigan, through **NQA-1**-compliant MASW/MAM field testing, data processing, analysis, and technical reporting.

- Conducted **NQA-1**-compliant MASW/MAM field testing and data processing for deep (~800 m) shear-wave velocity profiling at the Natrium Nuclear Power Plant (Kemmerer Unit 1 Site), Wyoming.
- Performed MASW/MAM site characterization and 2D numerical site response analyses to calibrate ground-response predictions beneath an instrumented bridge using the I-15 borehole array and ground motions from the 2020 M5.7 Magna earthquake (UDOT-sponsored project).
- Conducted MASW/MAM field testing for deep (~200 m) shear-wave velocity profiling at the Temple Square buildings in Salt Lake City, Utah.
- Planned and executed MASW/MAM field testing, data processing, and analysis for Vs30 seismic site classification of the SMASH Lab construction site at Utah State University and prepared the associated technical report.

Geotechnical Engineer 2020 - 2021
Easy Technical Services Pvt. Ltd. Kathmandu, Nepal

- Conducted geotechnical site investigations for roadway and foundation projects.
- Evaluated subsurface conditions and soil properties using Standard Penetration Tests (SPT).
- Prepared geotechnical engineering reports and technical specifications for design and construction projects.

Civil Engineer 2018 - 2019
National Reconstruction Authority, Government of Nepal Nuwakot, Nepal

- Inspected the reconstruction of 400+ houses damaged by the 2015 Gorkha Earthquake to evaluate compliance with national reconstruction standards.
- Led ward-level community awareness programs focused on earthquake-resistant reconstruction and resilience in areas affected by the 2015 Gorkha Earthquake.

HONORS AND AWARDS

- Graduate Enhancement Scholarship, 2026, Utah State University, $4,000.
- Graduate Student Travel Award, 2026, Utah State University.
- Merit-Based Scholarship, Tribhuvan University, Nepal. Ranked 84th out of 1,200 in the nationwide M.S. entrance examination.
- Merit-Based Full Scholarship, Tribhuvan University, Nepal. Ranked 278th out of 13,000 in the nationwide B.S. entrance examination.

CERTIFICATIONS AND TRAINING

- Completed the “One-dimensional Nonlinear and Equivalent Linear Site Response Analysis in RSSeismic” course offered by CalGeo (March 2026).
- Completed FLAC3D In-person Training Course, ITASCA Consulting Groups, Minneapolis, MN (April 2024).
- Completed DesignSafe Academy Training and NHERI Hackathon on High-Performance Computing (HPC), Austin, Texas (Jul 2022).

LEADERSHIPS AND MEMBERSHIPS

- President, Earthquake Engineering Research Institute (EERI) Student Chapter, Utah State University (2024-2025).
- Inaugural Secretary, EERI Student Chapter, Utah State University (2022 – 2023).
- Early Career Member, Earthquake Engineering Research Institute (EERI)
- Student Member, American Society of Civil Engineers (ASCE)
- Registered Engineer, Nepal Engineering Council (Reg. No. 16464 Civil 'A' Category)
- Member, Nepal Engineers' Association; Nepal Geotechnical Society

SELECT COURSES TAKEN

- In-situ site characterization
- Geotechnical earthquake engineering
- Shear strength of soils
- Consolidation and settlement
- Ground improvement
- Earth structures
- Deep foundations
- Advanced soil mechanics
- Advanced rock mechanics
- Underground excavation and tunneling
- Solid Mechanics
- Numerical methods
- Inverse theory
- Structural Dynamics
- Probability and Statistics
- Risk informed decision making
- Project management
- Construction management

REFERENCES

References available upon request.