UNIVERSITÀ DELLA CALABRIA
DIPARTIMENTO DI INGEGNERIA DELL'AMBIENTE

Lunedi 22 Giugno 2026, ore 11:00
Aula Seminari, Cubo 45A (Piano Terra)
Dipartimento di Ingegneria dell'Ambiente, Università della Calabria

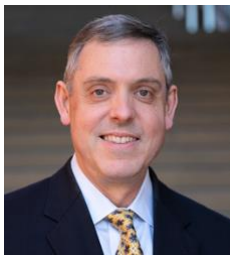
Link Teams

Review of Site Response Modeling Conditional on HVSR

Prof. Jonathan P. Stewart, Ph.D., PE, NAE

Abstract: Frequency-dependent horizontal-to-vertical spectral ratios (HVSRs) of three-component recordings can provide useful information on site resonant frequencies, which are potentially useful for predicting site response. Despite this potential, HVSR-conditioned site response models have not been adopted in the ground motion models most often employed for ground motion prediction in the United States and most global regions. I suggest that this stems from HVSR data resources being unavailable to support model development until recently, ongoing questions related to how HVSR should be measured and interpreted, and lack of consensus on how HVSR data should be utilized for site response prediction.

This presentation will briefly outline these implementation challenges. As part of that discussion, I will review recently compiled data archives, issues related to the measurement of HVSR from earthquake or microtremor signals (eHVSR vs. mHVSR), and peak identification strategies focusing on applications to western United States sites. I will also describe site response modeling approaches including non-parametric models conditioned on mHVSR ordinates and parametric models conditioned on attributes of mHVSR peaks (i.e., peak frequency, amplitude, and width) or the lack of peaks. I will discuss the statistical performance of available models and describe considerations related to the potential future practical application of HVSR models.



Bio: Jonathan P. Stewart's technical expertise is in geotechnical engineering, earthquake engineering, and seismology. He works on problems related to hazard characterization and infrastructure response to those hazards. Past leadership positions have included service as a Department Chair at UCLA, Chief Editor of two major journals (Journal of Geotechnical and Geoenvironmental Engineering and Earthquake Spectra), and as a member of the EERI Board of Directors. He currently serves on the University of California Seismic Advisory Board, Chairs the Steering Committee of the USGS National Seismic Hazard Model program, and is a member of the Provisions Update Committee that prepares the NEHRP Provisions for the Seismic Design of Building Structures. Among other professional recognitions, he was a Fulbright Scholar, Joyner Lecturer, and is an elected member of the US National Academy of Engineering.