FRIEDMAN FAMILY VISITING PROFESSIONALS PROGRAM

Visit to Utah State University: March 20, 2025

This report summarizes the visit of **Dr. John Thornley** from WSP that took place at Utah State University on March 20, 2025.

ITINERARY OR AGENDA

The table below outlines the itinerary of Dr. Thornley's visit:

Event	Start Time	End Time	Event Duration	Location
Student Chapter President Nishkarsha Dawadi meets and welcomes Dr. Thornley + Tour of Campus	10:30 AM	11:00 AM	30 minutes	
Meeting with the USU Seismic Design Competition Team Captain Joseph Stringham	11:00 AM	11:30 AM	30 minutes	ENLAB 124
Meeting with Prof. Marv Halling (Structural faculty and Department Head)	11:30 AM	12:00 PM	30 minutes	ENLAB 264
Lunch with Graduate Students	12:00 PM	1:00 PM	60 minutes	ENLAB Conference Room 211 C
Meeting with Prof. Soheil Safaei (Structural Faculty)	1:00 PM	1:30 PM	30 minutes	
Meeting with Prof. James Bay (Geotech Faculty)	1:30 PM	2:00 PM	30 minutes	ENLAB 266
Meeting with Prof. Mohsen Esteghamati (Structural Faculty and EERI USU Student Chapter Advisor)	2:00 PM	2:30 PM	30 minutes	ENLAB 264
Break	2:30 PM	3:00 PM	30 minutes	
Meeting with Prof. Brady Cox (Geotech Faculty)	3:00 PM	3:30 PM	30 minutes	ENLAB 276
USU Smash Lab Tour with Prof. Brady Cox	3:30 PM	4:00 PM	30 minutes	SMASH LAB
Break / Presentation Prep	4:00 PM	4:30 PM	30 minutes	
CEE Seminar Presentation	4:30 PM	5:30 PM	60 minutes	ENGR 106
Dinner	6:30 PM	7:30 PM	60 minutes	Local Restaurant in Logan

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

- Nishkarsha Dawadi, President, nishkarsha.dawadi@usu.edu
- Joseph Stringham, Undergraduate Liaison, joseph.stringham@usu.edu
- Deepika Ghorasaini, Event Coordinator, deepika.ghorasaini@usu.edu
- Kyle Cannon, Treasurer, kyle.cannon@usu.edu
- Pranish Dahal, Secretary, pranish.dahal@usu.edu
- Dr. Mohsen Zaker Esteghamati, USU EERI Chapter Faculty Advisor, Professor, Department of Civil and Environmental Engineering, mohsen.zaker@usu.edu
- Dr. Brady Cox, Professor, Department of Civil and Environmental Engineering, brady.cox@usu.edu

VISITING PROFESSIONAL LECTURE OVERVIEW

Dr. Thornley's lecture, titled *"Liquefaction Mitigation of Loose Coral Sand Beneath Tank Foundations in the Marshall Islands,"* covered a project addressing liquefaction risks beneath fuel storage tanks on Kwajalein Island. Initial CPT data, assessed using standard screening methods, indicated high settlement potential. However, recognizing the unique behavior of coral sand compared to typical quartz and silica sands, the team conducted specialized testing, including CPT calibrations, triaxial, and cyclic shear tests. Results showed the coral sand was less susceptible to liquefaction than expected, allowing for a more efficient ground improvement approach.

Figure 1: Dr. Thornley (center) with USU EERI chapter president and USU CEE faculty attending his lecture.

Figure 2: Dr. Thornley with lecture attendees.

Dr. Thornley's lecture was highly informative and well delivered, offering valuable insights into the unique geotechnical challenges of working with coral sands. Through a clear explanation of the testing program and the development of a site-specific constitutive framework, the presentation highlighted the limitations of applying conventional liquefaction screening methods to non-silica sands. The findings underscored the importance of tailored analysis in complex geological settings and demonstrated how site-specific data can lead to more effective and efficient ground improvement solutions.

Lecture Abstract

The lecture titled "Liquefaction Mitigation of Loose Coral Sand Beneath Tank Foundations in the Marshall Islands" focused on a project addressing the seismic vulnerability of large fuel storage tank foundations on the remote island of Kwajalein. Initial cone penetration testing (CPT), interpreted using conventional liquefaction screening methods, suggested a significant potential for seismically induced settlement. However, these methods are primarily based on the behavior of quartz and silica sands, which differ significantly from coral sands. To better assess the true liquefaction potential, bulk samples of the coral sand were collected, and a detailed testing program—including CPT cone calibrations, triaxial testing, and cyclic direct simple shear tests—was conducted. A site-specific constitutive framework was developed to evaluate liquefaction triggering more accurately. The findings revealed that the Kwajalein coral sand is less susceptible to liquefaction than originally assumed, allowing for the optimization of the ground improvement program.

Professional Bio

John Thornley, PhD, PE, BC.GE is a Vice President and Technical Fellow at WSP in Anchorage, Alaska. He has 20 years of geotechnical and earthquake engineering experience. Recently John was a co-lead for the EERI Learning from Earthquakes Reconnaissance effort for the November 30, 2018, M7.1 Anchorage, Alaska Earthquake. John is currently the chair of the Municipality of Anchorage Geotechnical Advisory Commission and is active in several organizations including ASCE, EERI, and SSA. He has served as field manager of geotechnical studies and prepared recommendations for a variety of infrastructure projects including buildings, roads and airports, large liquefied natural gas and water storage tanks, pipelines, wind and cellular towers, and utilities. As part of John's work, he has been involved in seismic hazard studies, seismic site response analyses, studies for large infrastructure buildouts, and cold regions and permafrost engineering. His design work includes ground improvement in liquefiable soils, deep and shallow foundations, slope stabilization, retaining structures, and embankments.

SUPPLEMENTAL ACTIVITIES

Lunch with Graduate Students

Dr. Thornley had lunch with undergraduate and graduate students from the CEE department, where he shared valuable experiences from his student years to challenges throughout his career and transition into professional practice.

Meeting with the Department of Civil and Environmental Engineering Faculties

Faculty members in the CEE department were allocated a 30-minute meeting with Dr. Thornley, during which they discussed personal and professional experiences and exchanged ideas.

RESULTS, FEEDBACK, AND LESSONS LEARNED

The program was a resounding success and received positive feedback from both students and faculty. We eagerly anticipate hosting similar events in the future, with a particular emphasis on engaging undergraduate students. Specifically, our student chapter plans to organize:

- A lecture featuring past seismic design-winning teams sharing their experiences.
- A meet and greet event with student chapters from across the United States and globally.

ACKNOWLEDGMENTS

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