What is the CGPR doing these days?

A Message from Mike Duncan

A new academic year has started, and we welcome a group of 37 new and continuing geotechnical engineering graduate students to our labs and classrooms. As happens every year, the students are already attacking their studies with the contagious enthusiasm that makes our program so enjoyable and fulfilling for all of us. You can get a feeling for what is happening here from the paragraphs below about the reports, short courses, research and computer programs that the group is working on, all at your request. All of us are energized by the thought that these projects are done at the request of our members, practicing engineers who see the needs of the profession and understand the value of the things we accomplish here. Jim Mitchell and I feel privileged to continue our involvement in the program. We invite you, alumni or friends, to find an opportunity to visit campus and see for yourself what the CGPR and the rest of the geotechnical group is doing these days.

Virginia Tech's Geotechnical Engineering Graduate Students, Fall 2018

2018 New Initiatives

We are developing reports and a short course that address several of the top-ranked initiatives from our March 2018 annual meeting with members, including:

1. **Just completed:** "Managing Construction Noise and Vibrations (revision to CGPR #35)" by William Shaffer and Joseph E. Dove. This update includes recent published literature, international standards for construction vibration, and case histories. CGPR #93 (August 2018).

2. A short-course on the state-of-practice for selected geotechnical earthquake engineering topics, including assessing liquefaction potential and differences between the ASCE 7-10 and ASCE 7-16 guidance documents. This short-course will be offered by Professors Russell Green and Adrian Rodriguez-Marek.

3. Correlations of residual shear strength parameters with index properties. Professor Tom Brandon and Dr. Bernardo Castellanos are working with graduate student Jenna Ritchie on this project.

4. A best-practices manual for seismic site-response analysis for the Central and Eastern US. Professors Adrian Rodriguez-Marek and Russell Green are working with graduate student Alex Juliano on this project.

5. Comparison of readily available, specialized computer software for analysis and design of excavation support systems, including descriptions of the underlying theories and calculation details where these can be discerned, as well as comparison with existing simplified and chart-based solutions. Professor George Filz is working with graduate student Roger Knittle on this project.

6. A summary of analysis and design methods for vertical drains for liquefaction mitigation, including commentary. Professor Russell Green is working with graduate student Rachel Kizer on this project.

CGPR Services for Members Now Include

- A website link for members only to access resumes and contact information for current geotechnical graduate students. See the "Information about Virginia Tech Geotechnical Graduate Students" link at www.cgpr.cee.vt.edu.

- Limited free consulting services to CGPR members for your laboratory testing needs, including helping you plan your laboratory testing programs, as well as checking test results from other laboratories. The Geotechnical Program at Virginia Tech is proud to have one of the biggest and best-equipped geotechnical laboratories in the nation. In addition to our free services, we can also perform advanced geotechnical tests for our members for a fee. Please check our

website at www.cee.vt.edu/englishlab, and contact Professor Tom (tbrandon@vt.edu) or Dr. Bernardo Castellanos (bernardo@vt.edu), who are in charge of our laboratories, for more information.

- Limited free consulting by geotechnical engineering faculty. If you are looking for a fresh perspective on a challenging project, one of our eleven geotechnical engineering faculty members will be happy to spend a few hours with you, free of charge. Contact Sandy Simpkins at sandy@vt.edu for arrangements.

- Literature searches. If you need to locate information about innovative technologies, unusual applications, or just something new to you, we will search the literature to locate publications that may be helpful, and we will provide you with bibliographic information and abstracts. Contact Sandy Simpkins at sandy@vt.edu.

- Concise and practical CGPR manuals, reports, and computer programs that are free to members. We have published 94 reports on topics requested by members, with more being added every year. See the "CGPR Publications" link at www.cgpr.cee.vt.edu.

2019 Annual Meeting & Lecture Program – March 4 and 5, 2019

Mark your calendars for the 2019 CGPR Annual Meeting and Lecture Program, which will be on March 4 and 5 at The Inn at Virginia Tech. The meeting and associated events will again provide an excellent opportunity to meet our graduate students and to provide your input on CGPR activities for the coming year. The featured speaker for the Lecture Program will be Professor Ellen Rathje of the University of Texas at Austin. Her presentation of seismic site response analysis will focus on practical issues, such as identifying sites that are modeled well by 1D analysis, site characterization including the role of geophysical measurements, and issues related to large strains. We are also pleased that Dr. Rudy Bonaparte will present his 2018 Terzaghi Lecture titled "Geotechnical Stability of Waste Fills – Lessons Learned and Continuing Challenges."

Geotechnical Student Organization News

The GSO will be very active again this year. The schedule for Fall Semester includes the following events:

- A beginning-of-semester ice-breaker party at which we welcomed new and returning graduate students

- A field trip to the Hokie Stone Quarry, which is the source of the limestone blocks used for buildings on campus.

- Participation in the Virginia Tech Science Festival, which attracts about 5,000 people a year, mostly children between the ages of 5 and 15.

- Participation in an Open House event for freshmen in Virginia Tech's College of Engineering. Engineering students here enter specific engineering departments in the sophomore year, and the Open House provides freshmen with information they can use to choose their preferred departments. The Civil and Environmental Engineering Department hosted 300 freshmen at the Open House. GSO students set up demonstrations and activities involving soil and rock sampling, in-situ testing, laboratory testing, and mechanically stabilized earth walls. The freshman visitors responded very positively to these activities.

- An educational outreach event to primary and secondary schools in Charlotte North Carolina that serve populations that are underrepresented in engineering.

- Under the leadership of Honorary CGPR Member Dr. Ray Martin, several geotechnical graduate students are preparing for a service and educational visit to Guatemala to help with a mine that may be releasing acid mine drainage and has stability concerns at the tailings dam and spillway.

- Our annual end-of-semester holiday party, at which we celebrate the semester and say goodbye to graduating students.

A New Opportunity for Recruiting Undergraduate Students

The Civil and Environmental Engineering Department is providing a new opportunity for companies to build student awareness of their firms by holding "Silent Recruiting" events. A popular choice is to display a banner in the Patton Hall lobby for a period of about two weeks. This is often followed by a table in the lobby staffed by a company representative who can answer student questions and provide materials. Please contact Ms. Kara Lattimer (540-231-7148 or karalatt@vt.edu) for more details. Events are at no cost and are especially effective for reaching undergraduates.

Faculty News

Dr. Rodriguez-Marek is a member of a team of international experts evaluating seismic hazards for all operational nuclear power plants in Spain. The project is conducted under the “SSHAC Level 3” framework. The project team is charged with including all defensible interpretations of the available data and models for evaluating hazard at these sites. The project is scheduled for completion in September 2019. Dr. Rodriguez-Marek also serves on a review panel for a similar project for a nuclear power plant in Taiwan.

Professor Russell Green was awarded the Whakapukahatanga Taiao Research Fellowship from the Department of Civil and Environmental Engineering, University of Auckland, New Zealand. The fellowship enabled Russell to spend July-August 2018 at the University of Auckland performing collaborative research on liquefaction evaluation.

Two of Professor Green's students received notable awards. Kristin Ulmer received the Federal Emergency Management Agency (FEMA) / National Earthquake Hazard Reduction Program (NEHRP) Graduate Fellowship to develop an energy-based liquefaction evaluation procedure. Thomas Kennedy was awarded the Leifur Eiriksson Foundation (LEF) Scholarship to perform research at the University of Iceland on earthquake site response coefficients for engineered fills.

Professor Green was a Plenary Keynote Speaker at the 2018 Geotechnical Earthquake Engineering and Soil Dynamics V conference held in Austin, Texas, where he presented "The Influence of the Non-Liquefied Crust on the Severity of Surficial Liquefaction Manifestations." He was also a Themed Session Speaker at the 11th National Conference on Earthquake Engineering (11NCEE) held in Los Angeles, California, where he presented "Liquefaction Hazard due to Induced Seismicity: Overview of the Pilot Study Being Performed for the Groningen Region of the Netherlands."

Will Shaffer, **Professor Joe Dove**, and Dr. Brian Bruckno of VDOT are preparing a CGPR report titled "Detection of Subsurface Anomalies by Geophysical Methods" (CGPR Report #95). The report describes a study that evaluates the ability of various geophysical methods to detect subsurface anomalies such as voids or low-density zones that were simulated by buried geofoam blocks at a test site. The locations of the blocks were known only to VDOT personnel during the study. Teams from university research groups and consulting firms performed geophysical field tests and provided their interpretations of the anomaly locations. The team reports were compiled, and the interpretations were compared with the known anomaly locations. Electrical resistivity imaging, seismic refraction, microgravity, and ground penetrating radar were found to be the most effective methods for the combination of site conditions and anomaly materials investigated.

Professor Nina Stark maintains a blog of the Coastal & Marine Geotechnics Group at Virginia Tech. In this blog she reports ongoing research and teaching activity by her students and herself (http://coastalgeotech.blogspot.com/).

Dr. Bernardo Castellanos is one of the invited speakers at the 36th Annual Geotechnical Conference GEO-Omaha 2019 where he will present a lecture entitled "Use and Measurement of Fully Softened Shear Strength in Engineering Practice."

Professor George Filz presented the Buzz Hair Lecture on "Column-Supported Embankments" at the 2018 Louisiana Civil Engineering Conference, and he will present the keynote lecture on "Geotechnical Engineering at Kennedy Space Center" at the 2018 Ohio River Valley Soils Seminar.

Contact Information

We look forward to another productive year of CGPR activity. If you have any comments or questions, or if we can be of any other assistance, please let us know.

Dr. George Filz
Co-Director
E-mail: filz@vt.edu
Phone: (540)-231-7151

Dr. J. Michael Duncan
Co-Director
E-mail: jmd@vt.edu
Phone: (540)-552-5822

Ms. Sandy Simpkins
CGPR Office Manager
E-mail: sandy@vt.edu
Phone: (540)-231-5052
Fax: (540)-231-7532

Ms. Mary Hunter
CGPR Financial Manager
E-mail: hunterm@vt.edu
Phone (540)-231-5052
Fax: (540)-231-7532