

# Landslide Capacity Building Virtual Seminar Series

*Welcome from the Organizing Committee!*

- ***IRISE Consortium Members***
  - *Allegheny County, PA Dept. of Transportation, Federal Highway Adm., Michael Baker, Golden Triangle, PA Turnpike Commission*
- ***University of Pittsburgh***
  - *Gary Euler, Julie Vandebossche, Monica Bell, Dan Bain, Eitan Shelef, Steve Sachs, Kenny Doty, Paul Kovach, Anthony Iannacchione*
- ***Geotechnical Community***
  - *American Geotechnical & Environmental Services, Gateway Engineers, Gannett Fleming, GAI Consultants, Rite Geosystems, Hamel Geotechnical, Fisher Associates, DiGioia Gray Consulting*
- ***Academic & Government***
  - *Carnegie Mellon University, Mine Safety and Health Administration, National Institute for Occupational Safety and Health, Minnesota Dept. of Transportation*



# What's the Problem?

- ***According to the Southwestern Pennsylvania Commission, in the Pennsylvania Department of Transportation's Southwestern Districts, there are now about 350 slides. It would take an estimated \$235 million to fix these, but the region's transportation plan provides for only \$31 million. And when a slide occurs, lives are disrupted, and costly damage to homes, businesses and transportation systems results.***
- ***Increasing the money available to address the problem is only part of the solution. Efficient investment of those funds demands that we, as a profession, develop the needed geotechnical skills, including how to apply the latest technology to the problem of monitoring and fixing landslides and landslide prone areas.***



This landslide measures ~140-ft in length and ~60-ft in width

# Landslide Seminar Series Objectives

- ***Networking Opportunity***
  - ***To enhance professional interactions with the added benefit of exposing young engineers/geologists to the deep history of landslide identification and remediation***
  - ***To provide students with context and history about the landslide problem and the local professional companies, organizations, societies working in this field, so you have this context when interacting with the professionals***
- ***PLEASE ASK QUESTIONS! – use the chat function or raise your hand and ask questions via your microphone***



# Who is attending this seminar?

## *Students from*

- *the University of Pittsburgh*
  - *Civil and Environmental Engineering*
  - *Geology*
- *Carnegie Mellon University*
- *California University of Pennsylvania*
- *Indiana University of Pennsylvania*
- *Slippery Rock University*

## *Professionals from*

- *More to add soon....*

# **First Question – Please choose the response that most accurately reflects your opinion (choose only one)**

**What might a Geotechnical Engineer do?**

- a) Works with the engineering behavior of earth materials**
- b) Predicts the damage caused by natural hazards and uses this knowledge to develop prevention controls and recovery measures**
- c) Applies soil, rock, and groundwater mechanics to the design and predicted performance of earthen structures such as dams**
- d) Designs the foundations of bridges, buildings, and other man-made structures in terms of the underlying soil and/or rock**
- e) All of the above**

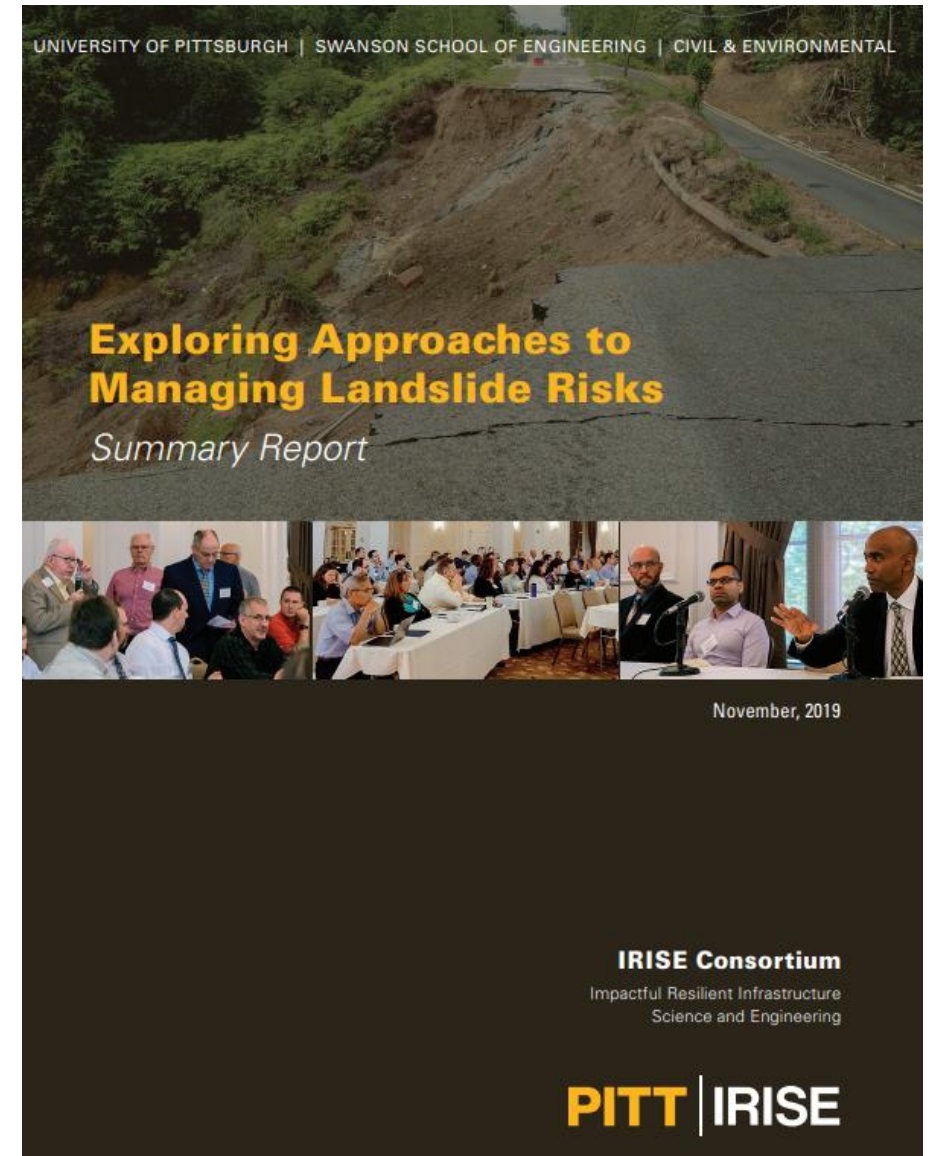
## **Second Question – Please choose the response that most accurately reflects your opinion (choose only one)**

**What might an Engineering Geologist do?**

- a) Works with civil engineers, structural engineers, architects, developers and planners to ensure that the geologic factors affecting the location, design, construction, operation, and maintenance of engineering works are accounted for**
- b) Interprets landforms and earth processes to identify potential geologic and related manmade hazards that may impact civil structures and human development**
- c) Characterize flow of groundwater using monitoring strategies and model these systems with empirical, analytical, and numerical methods**
- d) All of the above**

# Background (2019)

- ***Last August, IRISE sponsored a landslide workshop where this topic was discussed in great detail by members of our local geotechnical community. Several outcomes were identified to help improve the effectiveness and efficiency of our response to this problem. One was to improve the exposure of undergraduates to the landslide problem as they will eventually become the ones helping our governmental agencies and geotechnical firms design remediation efforts.***
- ***[https://www.engineering.pitt.edu/uploadedFiles/Content/Sub\\_Sites/Consortiums/IRISE/Content/News/Landslide%20Workshop%20Summary%20Report\\_FINAL\\_9Nov2019.pdf](https://www.engineering.pitt.edu/uploadedFiles/Content/Sub_Sites/Consortiums/IRISE/Content/News/Landslide%20Workshop%20Summary%20Report_FINAL_9Nov2019.pdf)***



# 2019 Landslide Workshop Goals

- 1) *Respond to IRISE Stakeholder concerns*
- 2) *Provide a venue for landslide practitioners to learn more about current and future landslide detection and remediation methods and techniques*
- 3) *Highlight new research activities and capabilities*
- 4) *Investigate methods to manage landslide risk*
- 5) *Explore sources for funding critical efforts*





# Background (2020)

- ***IRISE BOD approved an initiative to sponsor a landslide capacity building seminar series with the intent to discuss important geotechnical concepts, develop improved characterization of existing and potential landslide areas, and explore new innovative control methods.***
- ***The Covid-19 pandemic has disrupted our ability to network, i.e. to get students and professionals together***
- ***Promote interaction between students and the local geotechnical community***
- ***Students need to have a better idea about potential career tracks***

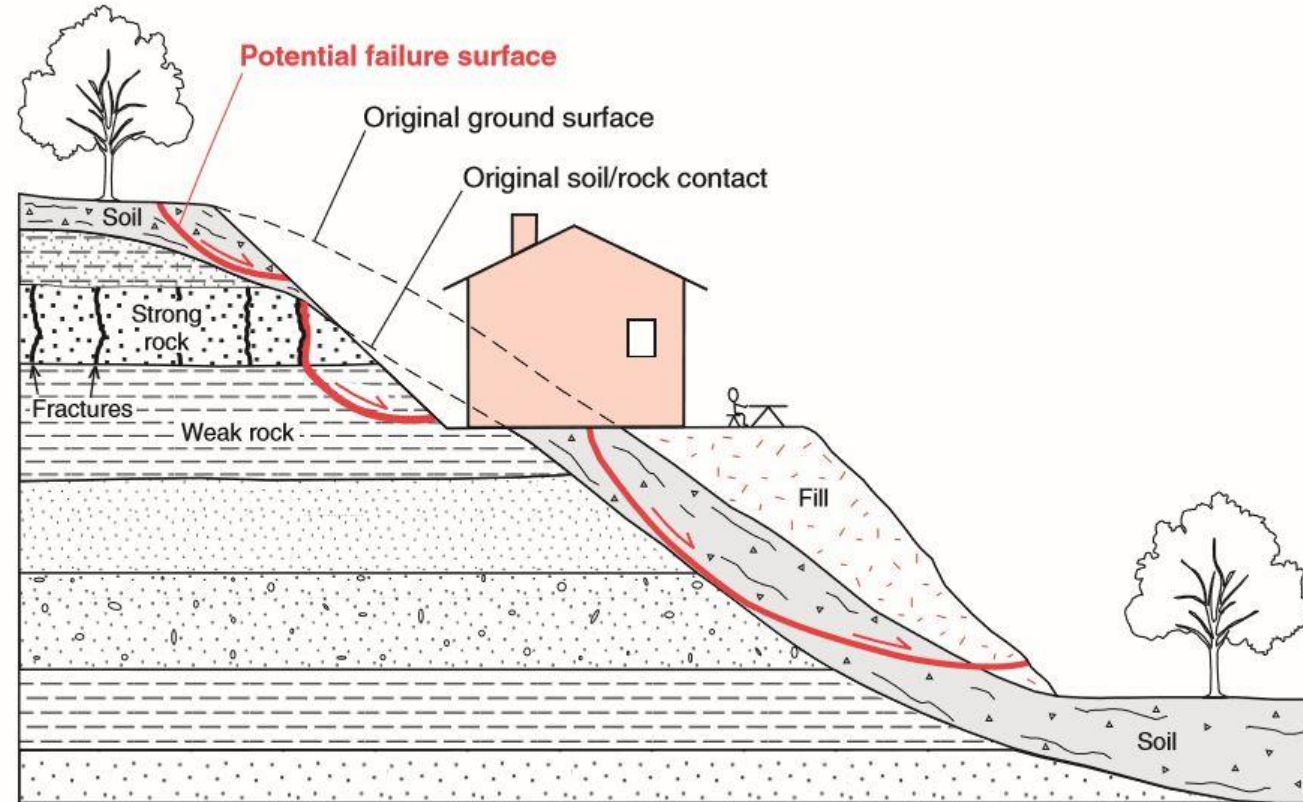
young engineers and geologists desire to work on projects that improve the future welfare of our community using sustainable practices.



# Third Question – Please choose the response that most accurately reflects your opinion (choose only one)

Would a house, your house, damaged by a landslide be covered by standard home owners insurance?

- a) Yes
- b) No
- c) Maybe

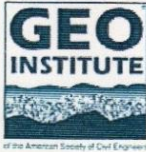



Figures from “Landslides in Pennsylvania”, by Delano and Wilshusen, 2001


# Historic Perspective (Local professional groups)

- *The Geotechnical community in southwestern PA has enjoyed a long and impressive history using new and innovative methods to solve an array of challenging problems.*
  - *Geo-Institute (American Society of Civil Engineers), formed in 1996 but was formed from the Geotechnical Group which had its origins in the 1950's.*
  - *Pittsburgh Geological Society, founded in October 1944 and incorporated in April 1945, a month prior to VE Day. By the end of 1945, PGS had 172 members, and over the years it has maintained memberships between 150 and 300. The current membership is 249, including 123 regular members (professionals), 84 student members, 18 honorary members, and 24 corporate members.*
  - *Local section of the Association of Environmental and Engineering Geologists (AEG), formed in 1975 and known as the Allegheny-Ohio Section is now known as the Greater Pittsburgh Chapter. Two national AEG meetings have been held in Pittsburgh, 1990 and 2015. Six Honorary Members (Philbrick 86; Ferguson 90; Gray 06; Voight 10; Shakoor & Hamel 15).*

# Historic Perspective (2004 Recognition of outstanding professionals)



Pittsburgh Section, Geo-Institute  
One-Day Interactive Seminar  
on  
**LESSONS LEARNED IN GEOTECHNICAL ENGINEERING**  
featuring  
**Dr. Elio D'Appolonia, P.E., Dr. A.C. Ackenheil, P.E.,  
Richard Gray, P.G., Dr. James Hamel, P.G., P.E.**



A.C. Ackenheil      Jim Hamel      Dick Gray      Elio D'Appolonia

Saturday November 13, 2004

***Examples - The Pittsburgh Section's Geotechnical Engineering Group of ASCE held a One-Day Interactive Seminar on November 13, 2004 entitled "Lessons Learned in Geotechnical Engineering". The four speakers provided an overview of the lessons learned in geotechnical engineering over the last 50 years.***

*Introductory remarks -- The Pittsburgh Section is rich with prominent practitioners in the field of geotechnical engineering. This region's irregular topography with steep hills, meandering rivers, and a diverse soil cover, provides many challenges for all manners of civil construction projects. Designing these structures is further complicated by a complex geologic environment, consisting of gently folded sedimentary rock units with a wide range of physical properties and a complex hydrologic character. Lastly, this region's ties with the basic industries of coal mining and steel making and the transportation need along our rivers, highways, and railroads, have provided the kinds of large engineering projects that enabled the practice of geotechnical engineering to develop and flourish. Engineers faced with these challenges required a thorough understanding of engineering principles, good engineering judgment, an innovative and entrepreneurial spirit, and clear vision.*

*Seminar Facilitator, Anthony Iannacchione (Nov. 2004)*

# Historic Perspective (2015 recognition of Pittsburgh geotechnical professionals at the 2015 AEG National meeting AEG outstanding professionals)

[https://youtu.be/XoJGEbachUA?list=PLWNFTNo5jYZZ8BTqu0srF\\_PSVrb-2VY8d](https://youtu.be/XoJGEbachUA?list=PLWNFTNo5jYZZ8BTqu0srF_PSVrb-2VY8d)



# 2020 Landslide Capacity Building Virtual Seminar Series Plan

***Friday August 28<sup>th</sup> (Today, students only)***

- ***Introduction to the Seminar (Dr Anthony Iannacchione)***
- ***The Role of Geology (Dr Dan Bain)***
- ***The Landslide Problem in SW PA (Dr Jim Hamel)***
- ***Remarks by the SSOE Dean (Dr James Martin)***



Students will be automatically signed up for the September 4<sup>th</sup> and 11<sup>th</sup> seminars. If you can't make it, please go to the registration site and cancel your reservation.

# Friday September 4th (First seminar with professionals)

*The focus of this seminar is landslide recognition and monitoring efforts*

- **Session A:**

- *Jim Hamel (Hamel Geotechnical Consultants): Visual Observation and Monitoring of Landslides*
- *Brian Heinzl (Gannett Fleming): Route 30 Emergency Landslide Repair, Use of Technology to Expedite Action*
- *Bruce Roth (GAI Consultants): Mt Washington Landslide*

- **Session B:**

- *Dan Messmer (Gateway Engineers): Landsides in the Greater Pittsburgh Area*
- *Melih Demirkan (Rite Geosystems): Geotechnical Instrumentation for Landslide Monitoring*
- *Suresh Gutta (American Geotechnical & Environmental Services): New Baltimore Landslide – Evolution of Instrumentation*

- **Session C:**

- *Sebastian Lobo-Guerrero (American Geotechnical & Environmental Services): Observational Method and Traditional Survey Methods to Monitor Rockslides*
- *Jonathan Moses (PennDOT): PennDOT District 11-0 Landslides and Remediation Techniques*
- *Roy Painter (PennDOT): SR 4099 Emergency Slide Repair*

# Friday September 11th (Second seminar with professionals)

*The focus of this seminar is new technology to recognize and monitor landslides*

- **Session A:**

- *Erich Zorn (DiGioia-Gray): Using Technology to Evaluate/Monitor High Hazard Inaccessible Rock Slopes*
- *Brent Slaker (National Institute for Occupational Safety & Health, NIOSH) Change Detection in Underground Limestone Mines Using LiDAR and Photogrammetry: Successes and Lessons Learned*
- *Tyler Rohan (University of Pittsburgh): Landslide Susceptibility Analysis Based on Citizen Reports to a 311 System*

- **Session B:**

- *Fatma Ciloglu (Michael Baker): Interim Risk Reduction Measures for Seepage Mitigation and Stability Improvement at Laurel Mountain State Park Water Supply Impoundment*
- *Christoph Mertz (Carnegie Mellon University's Metro21: Smart Cities Initiative): Photogrammetry and Neural Networks to Detect Form Changing Slope Conditions*
- *Raul Velasquez (Minnesota DOT): A Geomorphology-based Model for Vulnerability Assessment of Slopes in MnDOT*

- **Session C:**

- *Anthony Falbo (Fisher Associates.): Introduction to Static LiDAR Scanning*
- *Stanley Michalek (Mine Safety and Health Administration, MSHA): Monitoring Ground Movements at Mining Operations*
- *Max Winn (University of Pittsburgh): Utilizing Terrestrial Photogrammetry to Model Landslide Features*



# Seminar Information

[\(https://www.engineering.pitt.edu/irise/\)](https://www.engineering.pitt.edu/irise/)

*All the information related to the seminar will be posted (check your Zoom Chat features for the following):*

- *Abstracts*
- *Bios and Pictures (great for networking)*
- *PowerPoint presentations*
- *Agenda/Plan*

*After the last seminar*

- *Videos of the presentations (with the approval of the presenters) will be provided on the IRISE website along with other pertinent information)*
- *Our assumption is that students will be signed up for the September 4<sup>th</sup> and 11<sup>th</sup> seminars unless we hear otherwise*