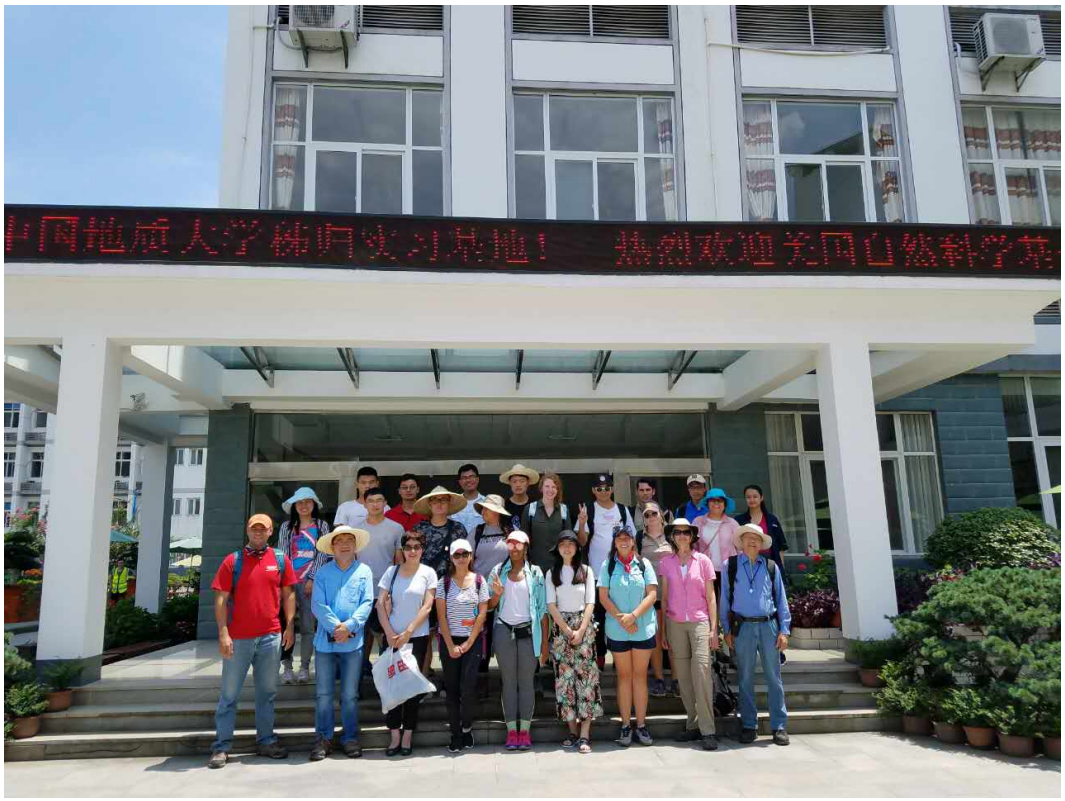
Week 6 Report

July 17, 2017

The American students welcomed Chinese students from the Beijing University of Technology to Zigui. The group was also fortunate to be accompanied by Dr. Nancy Sung, the director of the NSF office in China, on July 17th and 18th.

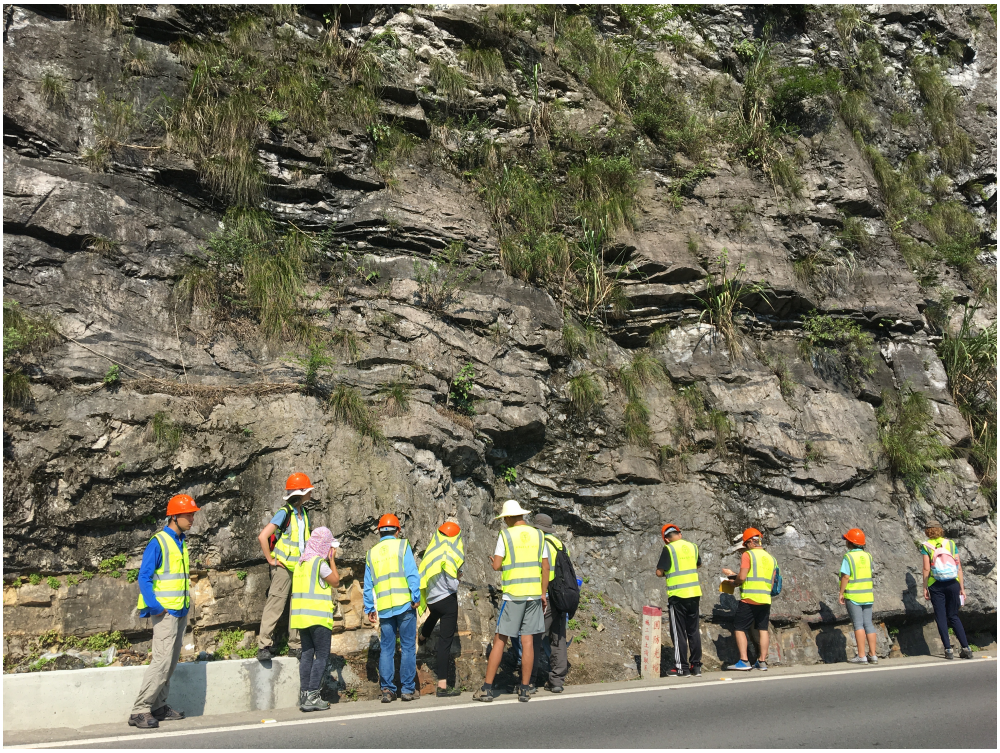


A group photo taken at the CUG Zigui Field Camp on July 17. In the bottom right-hand corner is Dr. Hanwen Zhou, field instructor of the US-China collaboration program. To the left of Dr. Zhou is Dr. Nancy Sung, the director of NSF Beijing office.

Dr. Zhou and Dr. Wang led the group to visit the Three Gorges Dam. The Three Gorges Dam is the largest hydroelectric dam in the world, and the construction of the dam has made a significant geological and environmental impact on the region. Dr. Zhou stressed the importance of the dam's location and vicinity to various geological and tectonic features. An afternoon thunderstorm rolled over the dam while the group was visiting, lending to the dramatic scenery.

July 18, 2017

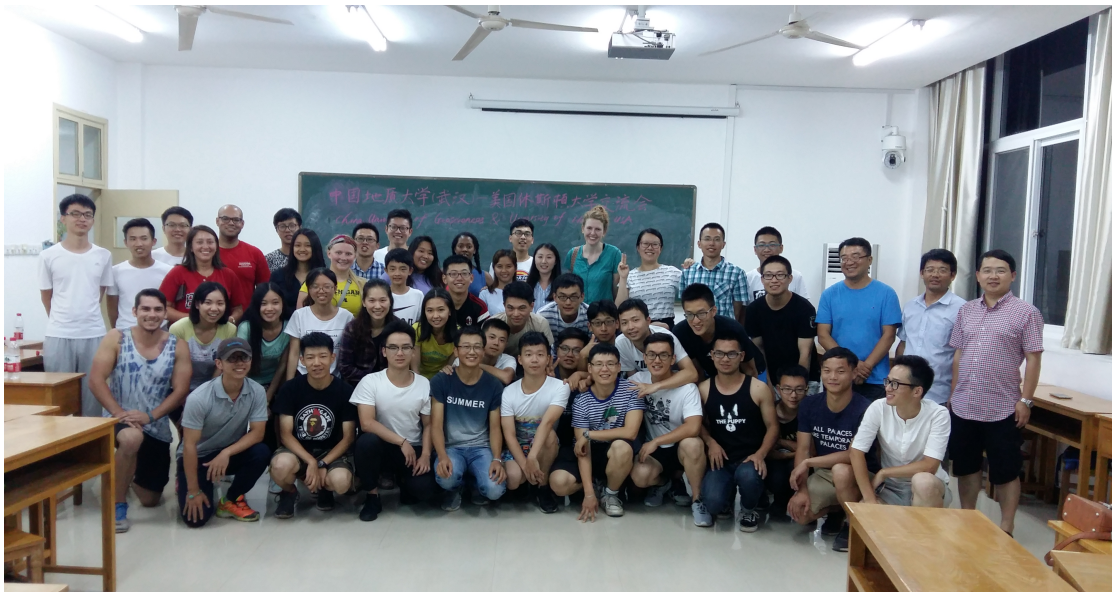
The group examined sedimentary rocks, folding, and faulting in the Zigui region. The students were pleased to identify many fossils in the rock exposures.



Students examining sedimentary rocks in the Zigui region.

In the afternoon, Dr. Zhou gave an onsite lecture on the Xintan Landslide and the Lianziya (Chain Cliff) Landslide. The Xintan Landslide event occurred on 12th June 1985, destroying the village of Xintan in the process. Fortunately, the landslide had been successfully forecasted, and the town was evacuated about ten hours before the catastrophic sliding. This Xintan Landslide has become a well-known example of a successful landslide monitoring system. Undoubtedly, without the evacuation there would have been a substantial loss of life. The local government agents and research institutes continue to actively monitor the location of the Xintan Landslide. The group finished their field day with a strenuous hike to view the Lianziya Dangerous Rock-Body.

The team climbed to the top of the Lianxiya Landslide area. The Xintan Landslide area is located across the river on the right.



American students and CUG students at the conversational event.

Erica Lucas and Eleanor Dietz chatting with geological engineering students from CUG.

In the evening, the American students joined CUG students for a conversational event. The Chinese and American students took advantage of the opportunity to ask each other a variety of questions—questions about culture, college, social life, hobbies, etc. The event fostered strong, personal cross-cultural exchanges.

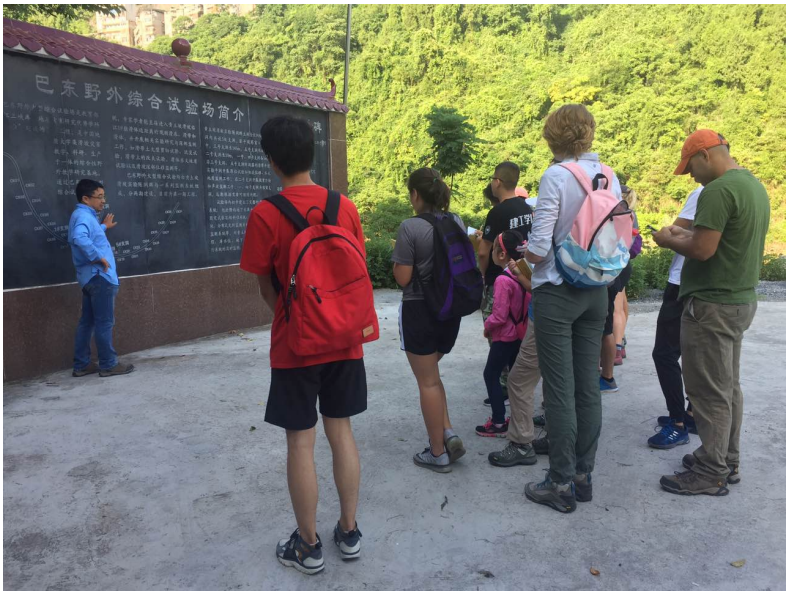
July 19, 2017

The group departed Zigui for Badong early in the morning. The journey was long but manageable with a delicious family-style lunch stop. Once in Badong, the group moved into the CUG satellite living quarters. The living quarters are conveniently located a few miles from the Huangtupo Landslide study area. The group ate three meals a day at the dining hall located in the CUG satellite living quarters—prepared by a chef, who traveled from Wuhan, to cook for the group.

The group at the CUG satellite living quarters with the manager.

July 20, 2017

The fieldwork component of the program commenced. Dr. Ma, a professor from CUG, led the group on an introductory tour of the CUG Huangtupo Landslide Exploration and Monitoring Tunnel. The tunnel has a variety of scientific equipment installed to monitor groundwater flow, water chemistry, deformation, gravity, and seismicity. The students were impressed by the cracks in the thick concrete tunnel walls—formed from surrounding rocks moving at varying rates. The lithologies and orientation of the landslides hanging-wall and footwall were also examined.



Dr. Wang giving an overview of the tunnel layout.

In the afternoon, the group visited a ground-based SAR located in a civilian's attic. The ground-based SAR is used to monitor the Huangtupo landslide area; it is located directly across the Yangtze River from the study area. The students enjoyed fresh fruit while discussing the ground-based SAR.

After visiting the ground-based SAR, the group toured the area opposite the Yangtze from the Huangtupo Landslide area. The area is also landslide prone, and informative signs mark the landslide areas. These landslide areas are smaller in size

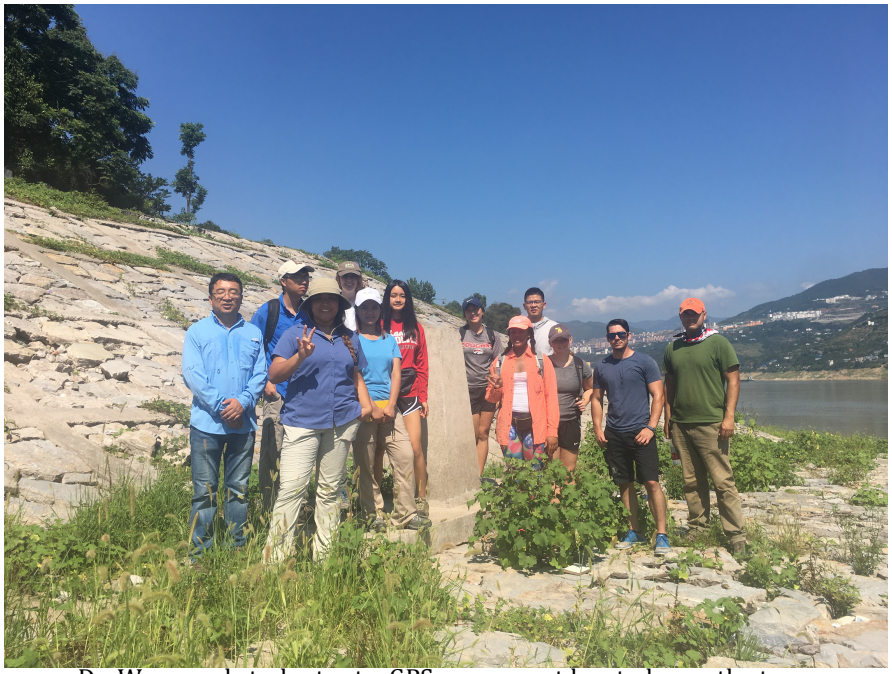
compared to Huangtupo; families still reside in the areas. The group also examined various rock outcrops while touring.

Many students spent their evenings exploring Badong—walking around, visiting the local bakery, and drinking milk tea. Some students even danced with a group outside of the supermarket.

The group pictured in front of a window located in a sub-tunnel.

July 21, 2017

Dr. Wang led the students on a tour of the Huangtupo Landslide area. The Huangtupo Landslide area had been evacuated, and the houses and buildings were demolished. The waste removal process was still in progress during the visit. It is evident that the landslide has and continues to impact the community immensely.

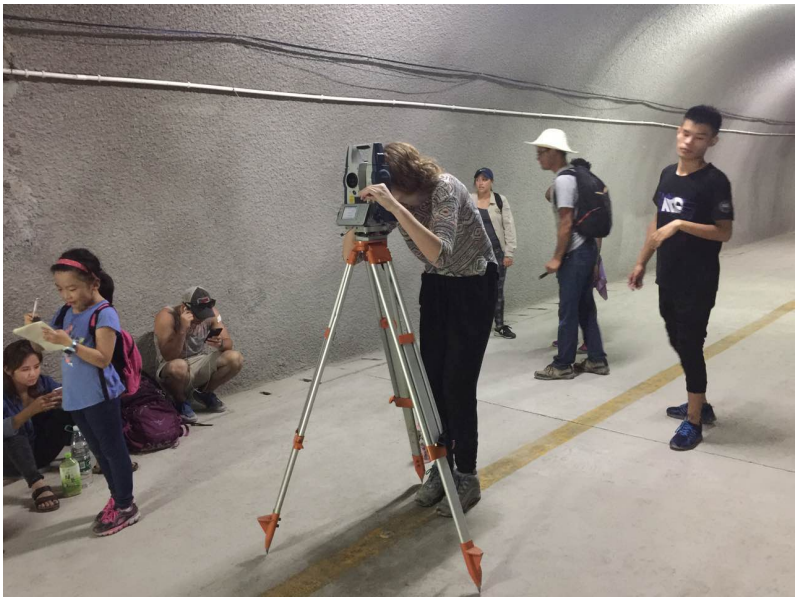


Dr. Wang and students at a GPS monument located near the toe of the Huantupo Landslide.

The students discussed the process that the government took in relocating residents of the Huangtupo Landslide area. The government pays the residents to relocate and supports them throughout the process; therefore, relocation is generally highly desirable. However, the relocation process took a serious toll on those living just outside the area that was evacuated. The community in the Huangtupo Landslide area quickly became nonexistent and residents living near the evacuated area still struggle to maintain their former lifestyle.

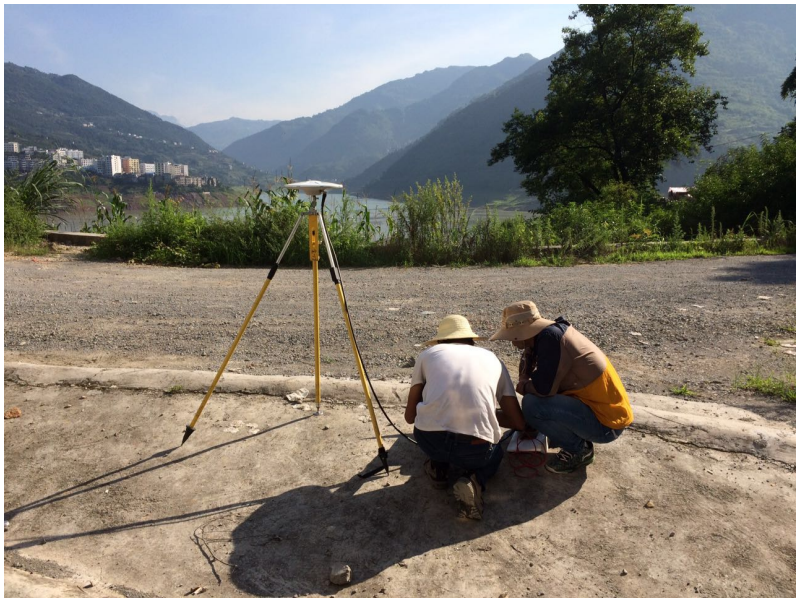
July 22 & July 23, 2017

The American students spent two days working in the CUG Huangtupo Landslide Exploration and Monitoring Tunnel with the students from Beijing University of Technology and a graduate student from the University of Houston. The American students were split into two smaller groups each day to learn about and utilize GPS, LIDAR, and Total Station technologies. The group from the Beijing University of Technology, along with the UH graduate student, continued their research from last year. The group is collecting data using GPS, LIDAR, and Total Station technologies to monitor deformation and changes in the Huangtupo Landslide area over the course of three years.



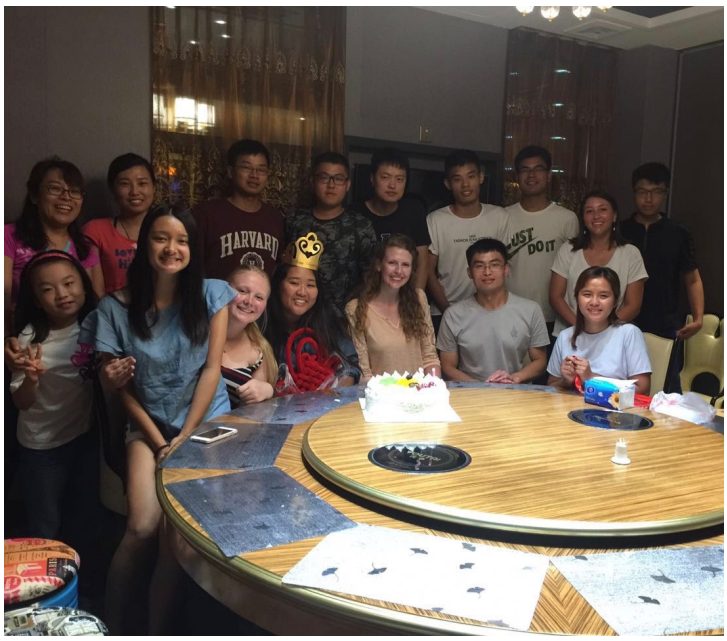
Hannah Bonner working with the Total Station.

Each of the American students assisted in completing multiple LIDAR scans of the tunnel. The LIDAR scans are useful to detect changes in the tunnel's cement walls that may have been caused by deformation associated with the landslide. The students also learned how to use the Total Station—measuring altitude differences, angles, and distances between reflectors placed at benchmarks located throughout the tunnel.



Students setting up GPS outside of the CUG Huangtupo Landslide Exploration and Monitoring Tunnel.

On July 22, one of the American students, Julie Monluc, celebrated her 21st birthday with the group at a restaurant in Badong. The group enjoyed a large feast accompanied by a birthday cake.

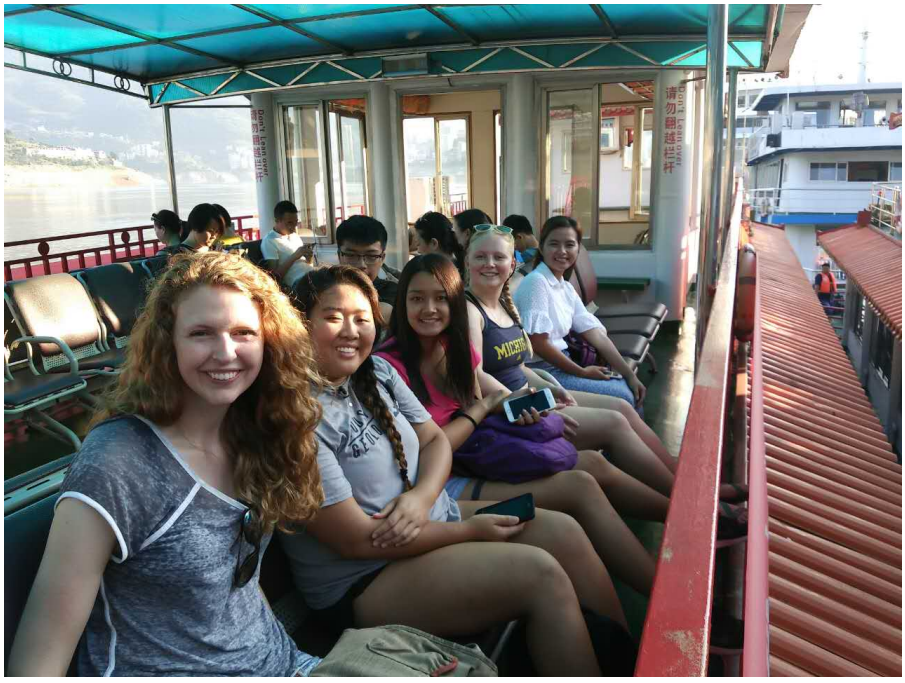


The American students and China University of Technology group celebrating Julie's birthday.

July 24, 2017

There were no formal plans other than a visit to the new Badong area in the late afternoon. Students spent their day preparing to travel back to Beijing and relaxing. In the morning, Dr. Wang accompanied four students on a river cruise along the Shennong Stream—an AAAAAA National Scenic Area. The cruise passed impressive limestone exposures and included a cultural performance.

Many of the residents formerly living in the Huangtupo Landslide area were relocated across the Yangtze River to the new Badong area. Many new apartment complexes and schools were recently built or in the process of being built in the new Badong area.



Hannah Bonner, Julie Monluc, Anna Wang, Erica Lucas, Lynn Nguyen, and James Wang enjoying the Shennong Stream cruise.