**Predict the sliding behavior of the Guobu slope, China: weakening or strengthening?**

The Guobu rock slope located on the upper stream of the arch dam of the Laxiwa Hydropower Station, China, deformed significantly and continuously during the impoundment of the reservoir. A maximum cumulative displacement over 40 m of the Guobu slope was observed and its further development directly threatens the safety of the dam and downstream towns/villages [1].

To predict its future evolution, the sliding behavior of the Guobu slope has to be characterized by available monitoring data. From the perspective of geomechanics, most landslide movements are controlled by the strength of the shear surface, usually characterized by friction for rock slides [2]. However, the spatial strength parameters for geomaterials usually are difficult to constrain, which poses a challenge for the prediction of landslide motion via numerical modeling. Inspired by the fundamental studies of friction, it has been found that some friction-dominated geophysical processes can be phenomenologically described through a state and velocity-dependent friction law [3]. Moreover, this state and velocity-dependent friction law can characterize the sliding strengthening and weakening behavior, which play a significant role in the early warning system of landslides. A so-called slider block friction model has been developed and applied to several landslide cases and provided a classification of sliding regime for landslides [4].

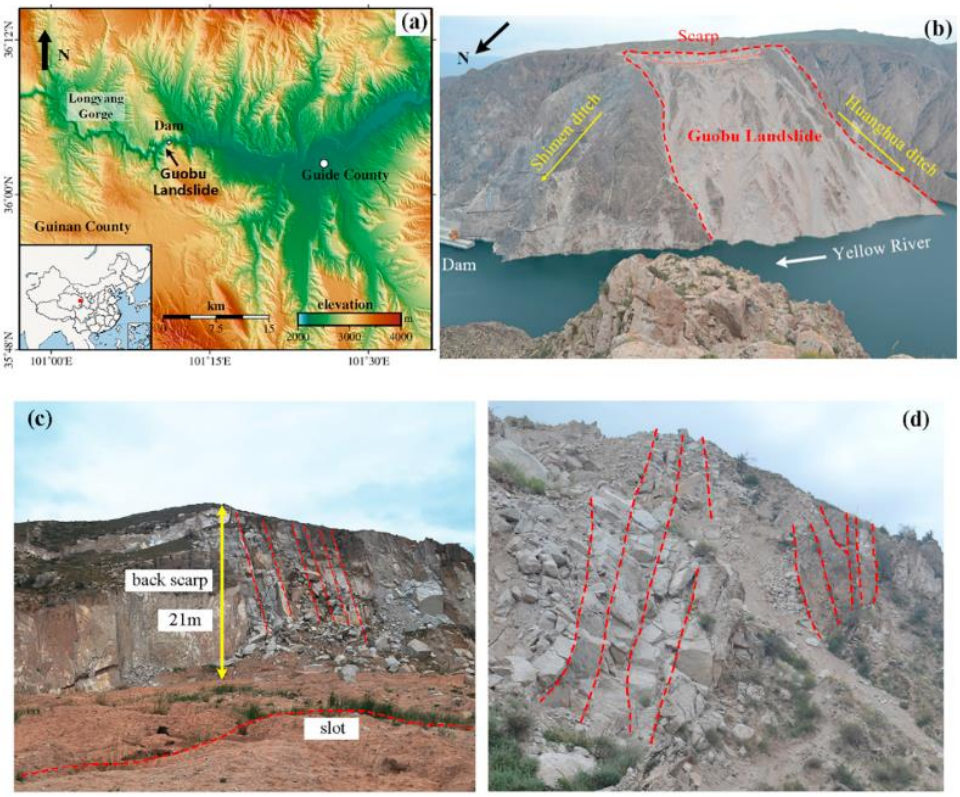


**Figure 1** Overview of Guobu slope, from [5].

In this project, the student will statistically study the movement of the Guobu slope (see Figure 1) based on available monitoring data. The slider block friction model will be applied to study the sliding regime of the Guobu slope and predict the future evolution this giant landslide.

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References:

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