

Master in geotechnical engineering applied to landslides



Topic : Investigation of a retrogressive landslide in lacustrine clay

Sensitive clays are marine clays deposited in a salty water which have later been exposed to fresh water and leached out. The decrease in salinity due to leaching makes these clays sensitive to remoulding and susceptible to large retrogressive landslides. The Government of Quebec has recently identified several retrogressive landslides in lacustrine clays. These landslides, unlike other landslides in sensitive marine clays of Quebec, occurred in clays deposited in fresh water and present a sensitivity that is not due to leaching. Université Laval, the Ministère des Transports (MTQ) and the Ministère de la Sécurité publique are collaborating to investigate these landslides. The objective of the master's project presented here is therefore to characterize one of these landslides and the soils involved in order to further document this type of landslide. In practice, this master's project consists of:

- analyzing the morphology of a landslide using Lidar data and aerial photos;
- performing various laboratory tests to determine the geotechnical and rheological properties of the materials involved in this landslide (sensitivity, consistency limits, scanning electron microscope observations and rheometer tests);
- modeling the landslide using software to reproduce the conditions that led to the landslide.

Start of the project: As soon as possible.

Prerequisites: Bachelor's degree in civil engineering, geological engineering, water engineering, construction engineering or an equivalent bachelor's degree. Be rigorous, have good autonomy and enjoy team work.

Funding: Financing available for up to 2 years max.

Location: The student will work at the Laboratoire d'études sur les risques naturels (LERN, www.lern.fsg.ulaval.ca). Located at the Faculté des sciences et génie of Université Laval, this research laboratory has gathered, now for more than 15 years, graduate students, trainees, research professionals and professors from the Department de génie civil et de génie des eaux and the Department de géologie et de génie géologique developing and sharing expertise in geotechnical engineering applied to the study natural hazards. The student will therefore be received in an already well-established scientific research group that will allow the student to collaborate and meet other students and researchers working in this environment.

Please submit a letter of introduction, a CV and your transcript to :

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