



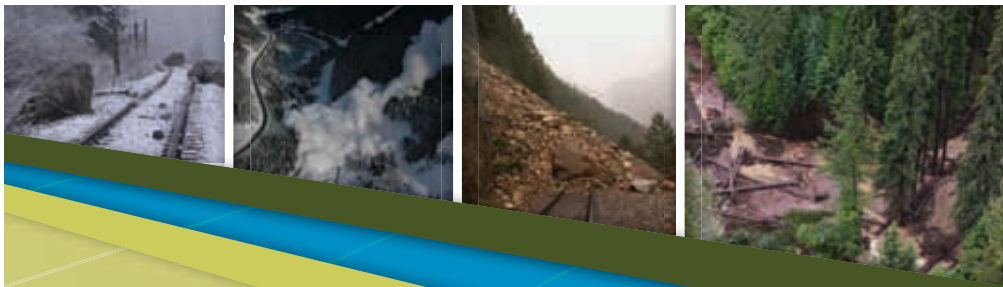
WHAT IS A RAILWAY GROUND HAZARD?

Railway ground hazards are natural hazards including rock falls, landslides, subsidence (sinking), erosion, or snow and ice conditions that can result in track failure or pose a risk to safe railway operations.



CANADA LEADS THE WORLD IN GROUND-BREAKING RESEARCH!

Canada's railway system is an integral component of our economy, transporting people and goods safely and efficiently across the country, to and from global markets. Maintaining a safe and efficient transportation network is a top priority for Canada's railway industry and Transport Canada. A key factor in railway safety is managing the risk from ground hazards.



WHAT TYPE OF WORLD-LEADING, INNOVATIVE RESEARCH HAS BEEN UNDERTAKEN?

Through developing ground hazard risk mitigation methods and state-of-the-art analysis tools, the RGHRP is placing Canada as a global leader in railway safety. The RGHRP facilitates innovation in the transport sector and creates opportunities to train skilled workers and experts for the railway industry.

WHAT IS THE RAILWAY GROUND HAZARD RESEARCH PROGRAM?

The Railway Ground Hazard Research Program (RGHRP) is a collaborative effort among industry, academic institutions and the federal government. The Program was created in 2003 to develop and evaluate scientific and technical solutions to help railways manage the risks associated with ground hazards.

The unique cooperation among RGHRP partners, which include the University of Alberta, Queen's University, Transport Canada and Canada's two largest railways, Canadian National Railway Company (CN) and Canadian Pacific Railway Limited (CP), shows commitment to the safety of Canadians and their quality of life. Sharing their resources has led to an innovative platform to advance scientific knowledge and develop industry standards. This approach also serves as a leading example for other countries.

HOW DOES THE RGHRP WORK?

The RGHRP has three research threads:

- University strategy-based research
- Railway-led operations-based research
- Transport Canada and Geological Survey of Canada directed research

Geotechnical engineering researchers from both universities lead the university-based research. Professors and students work directly with CN, CP, Transport Canada and consultants to investigate ground hazard risks and develop solutions to manage those risks.

RGHRP research projects include:

- *Ground hazard risk identification & analysis*
- *Landslide investigation*
- *Ground hazard event triggers*
- *Technology for evaluating, monitoring & predicting ground hazards*
- *Seismic rock fall detection*
- *Heavy axle loading on soft subgrades*
- *Risk mapping of sensitive clays*
- *Ballast fouling*
- *Risk estimation for railways and landslides*

RGHRP research results have been presented at national and international conferences and workshops. The program's research has been widely published in technical and professional journals and has also been implemented in Canada's rail industry's risk management strategies.

Looking for more information?
Visit the Canadian Rail Research Laboratory website:
www.carrl.ca

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