Date of Submission	26 March 2018

World Centre of Excellence (WCoE-2017-2020)
Progress Report Form 2018

29 May 2017 to 31 December 2017

1. **Short Title of WCoE**
   Landslide Monitoring and Critical Infrastructure

2. **Name of Institution (Name of leader and email)**
   Geological Survey of Canada (Peter Bobrowsky; peter.bobrowsky@canada.ca)
   University of Alberta (Michael Hendry; mhendry@ualberta.ca)

3. **List of core members**
   David Huntley (Geological Survey of Canada)
   Renato Macciotta (University of Alberta)

4. **Progress report of activities up to 31 December 2017 (up to 30 lines).**
   WCoE members from GSC have been actively involved in landslide monitoring technology through IPL Project 202 at the Ripley Landslide area in southern British Columbia, Canada. A total of 18 GSC staff members have participated in landslide related studies during the past year. GSC is a contributing partner to the RGHRP (Railway Ground Hazards Research Program) (monthly contributions and annual December workshop). In 2017 they promoted landslide studies through several conference presentations (WLF4, GSA), a number of publications (refereed and grey literature), reviewing articles for journals and books. Preparation for the 2018 IGCP meeting – Subaqueous Mass Movements and Their Consequences: Assessing Geohazards, Environmental Implications and Economic Significance of Subaqueous Landslides in Victoria (May 2018).
   WCoE members from U of A have participated in an extensive variety of landslides studies including ILP Project 202, but also at several other sites in Canada (10-Mile slide, **???).** A total of XX graduate and undergraduate students have been involved in landslide studies. U of A plays a lead role in the RGHRP for landslide and multihazard studies. They are involved in various slope stability studies across the country, supervise numerous students and participate in a number of landslide initiatives.

5. **Plan of future activities (up to 30 lines)**
   Both institutes will continue working at the Ripley Landslide and surrounding sites. Plans for 2018 include modelling of soil moisture regime, expansion of GeoCube installation to South Slide and 10 Mile Slide, evaluation and application of additional InSAR monitoring, testing of different UAV technology (higher resolution photogrammetry, multispectral imagery, etc.) and extending bathymetric mapping of the Thompson River to entire 10 km river stretch from Ashcroft. GSC staff will deliver the Subaqueous Mass Movements and Their Consequences conference and fieldtrip in Victoria.

6. Publication (in Landslides, proceedings, meeting reports, or WEB)

Bobrowsky, P., et al. (2017) Ripley Landslide – Canada's premier landslide field laboratory. *Geological Society of America, Proceedings Volume of the Annual Meeting*, Seattle, Washington, USA

Carla, T. et al. (2017) Displacement of a landslide retaining wall and application of an enhanced failure forecasting approach. *Landslides* (online)

Hendry, M.T. et al. (2017) Analysis of the measured pore pressure response to atmospheric pressure changes to evaluate small strain moduli: methodology and case studies. *Canadian Geotechnical Journal* (online)

Huntley, D., et al. (2017) Ripley Landslide: the geophysical structure of a slow-moving landslide near Ashcroft, British Columbia, Canada. *Geological Survey of Canada*, Open File 8062, 59 pages

Huntley, D., et al. (2017) Combining terrestrial and waterborne geophysical surveys to investigate the internal composition and structure of a very slow-moving landslide near Ashcroft, British Columbia, Canada. In: Mikoš M., Arbanas Ž., Yin Y., Sassa K. (eds) *Advancing Culture of Living with Landslides*. WLF 2017. Springer

Huntley, D., et al. (2017) Innovative landslide change detection monitoring: application of space-borne InSAR techniques in the Thompson River valley, British Columbia, Canada. In: Mikoš M., Arbanas Ž., Yin Y., Sassa K. (eds) *Advancing Culture of Living with Landslides*. WLF 2017. Springer

Huntley, D., et al. (2017) Fibre Bragg grating and Brillouin optical time domain reflectometry monitoring manual for the Ripley Landslide, near Ashcroft, British Columbia; *Geological Survey of Canada*, Open File 8258, 66 pages

Journault, J. et al. (2017) Measuring displacements of the Thompson River valley landslides, south of Ashcroft, B.C., Canada, using satellite InSAR. *Landslides*.

Macciotta, R. et al. (2017) Quantifying rock fall probabilities and their temporal distribution associated with weather seasonality. *Landslides* 14(6):2025-2039.

Macciotta, R. et al. (2017) Hazard ranking for railway transport of dangerous goods in Canada. *Case Studies on Transport Policy*, Elsevier.

Macciotta, R. et al. (2017) Rock fall hazard control along a section of railway based on quantified risk. *Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards*. 11(3) 272-284.

Macciotta, R. et al. (2017) The 10-Mile Slide and Response of a Retaining Wall to Its Continuous Deformation. In: Mikoš M., Arbanas Ž., Yin Y., Sassa K. (eds) *Advancing Culture of Living with Landslides*. WLF 2017. Springer

Roghani, A. and M.T. Hendry (2017) Quantifying the Impact of Subgrade Stiffness on Track Quality and the Development of Geometry Defects. *Journal of Transport Engineering, Part A: Systems*. 143(7):

Scanlan, K.M. et al. (2017) Evaluating the impact of ballast undercutting on the roughness of track geometry over different subgrade conditions. *Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit*. (online)

Yu, F. et al. (2017) Fracture behaviour at the sharp notch tip of high strength rail steels – influence of stress triaxiality. *Engineering Fracture Mechanics* 178:184-200.

Please fill and submit this form by 30 March 2018 to ICL Network <icl-network@iclhq.org>