Date of Submission	March 30, 2018

World Centre of Excellence (WCoE-13) 2017-2020
Progress Report Form 2018

1 January 2017 to 31 December 2017

1. Short Title of WCoE: Landslides in Weathered Flysch: from activation to deposition

2. Name of Institution: University of Ljubljana, Faculty of Civil and Geodetic Engineering (UL FGG), Assist. Prof. Ana Petkovšek, ana.petkovšek@fgg.uni-lj.si

3. List of core members: Assoc. Prof. Janko Logar, Prof. Matjaž Mikoš, Assist. Prof. Dušan Petrovič, Assist. Matej Maček

4. Progress report of activities up to 31 December 2017

In 2017, the most important activities of the WCoE were:

a) the organization of 4th World Landslide Forum in Ljubljana in June 2017 (www.wlf4.org; Alcántara-Ayala et al., 2017; Jemec Auflič et al., 2017a; Mikoš et al., 2017b), and

b) as a member of the ICL Adriatic-Balkan Network the organization together with Slovenian Geological Survey of the 3rd Regional Symposium on Landslides in the Adriatic-Balkan Region in October 2017 in Ljubljana, Slovenia (http://www.geo-zs.si/ReSyLAB2017/; Jemec Auflič et al., 2018).

At UL FGG, the UNESCO Chair on Water-related Disaster Risk Reduction (established in 2016; www.unesco-floods.eu), is a member of the UNITWIN Cooperation Programme on Landslide Risk Mitigation for Society and the Environment (activity report: http://iplhq.org/category/icl/unitwin-progress-report-icl/). The UNESCO Chair participated in the UL Summer school on Natural Hazards (including landslide risk and mitigation) that hosted close to 30 PhD students (May/June 2017) – details & results available at: http://www.let-group.com/summerschool.html.

In 2017, we prolonged the collaboration in a bilateral research project on landslides in flysch in Slovenia and Croatia with the University of Rijeka, Croatia (ICL Member). Both institutions using their research equipment measured soil water retention curves of residual soils covering flysch bedrock at the Valiči landslide (Peranić et al., in print).

In 2017, we have studied the rheological parameters of mudflows from the Slano blato Landslide and the 2000 Stože Landslide debris flow (Mikoš et al., 2017a). A study was performed on the Stože debris-flow source material to find influence of its maximum grain size on rheological parameters (Maček at al., 2017). The results were used to link existing measurements performed on fines to the real soil behavior and to see possible errors in the prediction of rheological parameters when using equipment with limiting maximum grain size. The results of this laboratory study were also used to simulate the 2000 Stože Landslide debris flow using Flo-2D (Sodnik, 2017). A model for the triggering phase and first mass movements of the 2000 Stože

Landslide debris-flow was made using LS-Rapid program based on classical geotechnical tests and geological mapping performed in 2001 (Sodnik et al., in print). Together with the Slovenian Geological Survey (GeoZS, ICL Member) landslide probability mapping was performed for the Potoška planina Landslide. A multi-model approach was used: a detailed field survey, GIS based landslide susceptibility model and numerical modeling in LS-Rapid program was applied to identify landslides and simulate triggering phase (Sodnik et al., 2017).
A PhD thesis dedicated to debris-flow hazard assessment on torrential fans was completed in 2017 (Sodnik, 2017).
We published several contributions to the ISDR-ICL Landslide Interactive Teaching Tools (Bezak et al., 2018; Mikoš & Hübl, 2018; Mikoš et al., 2018; Sodnik & Mikoš, 2018), and a bibliometric review of the journal Landslides (Mikoš, 2017).
We disseminated information about the results of the WLF4 and 3rd ReSyLAB to the local community in Slovenia (Mikoš et al., 2017c; Verbovšek et al., 2017; Jemec Auflič et al., 2017b);

5. Plan of future activities

In 2018, we will be working on the preparation of the World Construction Forum (www.wcf2019.org) in Ljubljana (April 8–11, 2019) with the main theme on *Buildings and Infrastructure Resilience*, including climate change and natural hazards. In 2018, we will be working in the framework of the national research program "*Water Science and Technology, and Geotechnical Engineering: Tools and Methods for Process Analyses and Simulations, and Development of Technologies*" (2017-2021). Furthermore, we will be working together with the Geological Survey of Slovenia (GeoZS, ICL Member) on the IPL-225 Project "*Recognition of potentially hazardous torrential fans using geomorphometric methods and simulating fan formation*", and on the IPL-226 Project "*Studying landslide movements from source areas to zone of deposition using a deterministic approach*".

6. Publication

Alcántara-Ayala I, Sassa K, Mikoš M, Han Q, Rhyner J, Takara K, Nishikawa S, Rouhban B, Briceño S (2017) The 4th World landslide forum: landslide research and risk reduction for advancing the culture of living with natural hazards. *International Journal of Disaster Risk Science*, 8(4), 498-502.

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Mikoš M, Čarman M, Papež J, Jež J (2018) State-of-the-art overview on landslide disaster risk reduction in Slovenia : TXT-tool 4.386-1.1. In: Landslide dynamics: ISDR-ICL landslide interactive teaching tools. Vol. 2, Testing, risk management and country practices. Berlin: Springer. 683-691.

Peranić J, Arbanas Ž, Moscariello M, Cuomo S, Maček M (in print) Determination of soil water retention curve of residual soil from flysch rock mass. In: Proceedings of the 7th Int. Conference on Unsaturated Soils. 8 p.

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