Date of Submission	

IPL Project (IPL - 179) Annual Report Form 2017

<u>1 January 2017 to 31 December 2017</u>

1. Project Number (approved year) and Title: **IPL-179 (2013-ongoing), Database of Glacial Lake Outburst Floods (GLOFs).**

2. Main Project Fields: Capacity Building B. Collating and Disseminating Information/ Knowledge

3. Name of Project leader: Dr. A. Emmer; Prof. V. Vilímek

   Affiliation: Charles University, Faculty of Science; Czech Academy of Sciences, Global Change Research Institute; aemmer@seznam.cz; vilimek@natur.cuni.cz

   Core members of the Project: Names/Affiliations: (4 individuals maximum)

4. Objectives: (5 lines maximum): GLOFs have been studied in various regions (e.g. Ives et al., 2010; O Connor et al., 2001), but no overall summary of these events has been done. This project aims to create broadly available overview of GLOFs, and provide basic information about them. This database can show some regional differences as well. Understanding them can help us to create an optimal regional method of GLOF hazard assessment.

5. Study Area: (2 lines maximum): We created online database including information about GLOFs appeared all over the world in past 150 years. The mountain range of Cordillera Blanca (Peru) has been chosen for the verification of our methods and field experiences.

6. Project Duration (1 line maximum): ongoing project

7. **Report**

1) Progress in the project: (30 lines maximum)

In 2017, the GLOFs database (glofs-database.org) has been moved from private server to the server of Charles University; hand in hand with this change, newly designed webpage including the online map has been introduced. The database has also been reported in WCoE activity report (Klimeš et al., 2017).

Regional database of GLOFs from moraine-dammed lakes in the Cordillera Blanca has been compiled and published (Emmer, 2017). Most importantly, it has been shown that: (i) the 28 studied events (four of which have not been mentioned before) occurred between 1725 and 2003 and at least 10 events occurred between 1939 and 1953; this period is, therefore, considered the peak frequency

period of GLOFs from moraine-dammed lakes in the study area (60-80 years since the end of the Little Ice Age); (ii) moraine dam breaches are the most frequent type of water release (n = 17; 60.7%), dam overtoppings, however, have dominated since the 1960s (9 out of 13 events), indicating a change in GLOF-related process chains; (iii) five extreme, eight major and 15 minor events are distinguished, according to the quantified geomorphological and societal impacts; (iv) all extreme and major events were caused by rapid mass movement into the lake; ice calving/avalanches dominated before the 1960s, while recent events have been frequently caused by landslides on exposed moraine slopes facing the lakes, suggesting a strong relation to ongoing glacier retreat and the exposure of moraine slopes; five events were associated with major earthquakes (1725 and 1970); (v) five extreme events claimed 6000-9000 fatalities; six events are reported to have caused fatalities and various degrees of material damage were reported for 10 out of 28 events.

2) Planned future activities or Statement of completion of the Project (15 lines maximum)

The most important task for further development of the GLOFs database still remains the involvement of respective local experts (or foreign experts with the appropriate regional knowledge) in order to validate the available data and in optimal cases also to use different types of local documentary and field data as well as to report new events.

3) Beneficiaries of Project for Science, Education and/or Society (15 lines maximum)

Despite the fact that the webpage of GLOFs database is still in its early stages of filling, this project has already received positive feedback from the scientific community (both data requests as well as data offers) and has also served as a platform for collaboration between scientific institutions from different parts of the world. The database falls into the framework of the strategy of the IPL (e.g. Sassa 2012) and is a part of the ongoing activities of the World Centre of Excellence (Landslide Risk Assessment and Development Guidelines for Effective Risk Reduction) awarded to the Academy of Science of the Czech Republic and Charles University in Prague.

4) Results: (15 line maximum, e.g. publications)

Emmer, A. (2017): Geomorphologically effective floods from moraine-dammed lakes in the Cordillera Blanca, Peru. Quaternary Science Reviews, 177: 220-234, doi: 10.1016/j.quascirev.2017.10.028.

Klimeš, J., Hartvich, F., Tábořík, P., J. Blahut, J., Briestensky, M., Stemberk, J., Emmer, A., R. Vargas, R., Balek, J. (2017): Studies on selected landslides and their societal impacts: activity report of the Prague World Centre of Excellence, Czech Republic. Landslides, 14: 1547-1553, doi: 10.1007/s10346-017-0837-4.

Note:

1) If you will change items 1)-6) from the proposal, please write the revised content in Red.

2) Please fill and submit this form by 30 March 2017 to ICL Network <icl-network@iclhq.org>