

Date of Submission	30.3.2017
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IPL Project (IPL - 179) Annual Report Form 2017

1 January 2016 to 31 December 2016

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

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

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

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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): The current version of the GLOFs database website, established in 2013, is available online at glofs-database.org. About one hundred GLOFs are presented on the website (as of October 2015) in the standard form, which is actually only one fifth of the total number of GLOFs so far collected from various data sources (Vilímek et al. 2014). The database is gradually being filled region by region, where validation has been performed. Data from the Peruvian Andes (regional database compiled by Zapata (2002), updated by Emmer et al. (2014), Patagonian Andes (regional database for Argentina and Chile recently compiled by Anaconda et al. 2015) and North American Cordillera (regional database compiled by Clague and Evans 2000; O'Connor et al. 2001) are well represented in the database, while other regions of GLOFs (see Tab. 1) have not yet been validated, put into the form and uploaded to the website.

- 2) Planned future activities or Statement of completion of the Project (15 lines maximum): Different lake types and the variability of the causes and mechanisms of GLOFs (e.g., Clague and Evans 2000) make every attempt to provide a worldwide database a challenging issue. To cover this complexity, a versatile form has been designed (see Vilímek et al. 2014); however, existing regional databases do not usually provide sufficient information to complete an entire form for each GLOF event. Compilation and verification of all available data from various sources including local documentary data and field data is of high importance (Raška et al. 2014). The most important task for further development of the GLOFs database, therefore, is 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
- 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):
- Vilímek, V., Emmer, A., Huggel, C., Schaub, Y., and Würmli, S. (2014) Database of glacial lake outburst floods (GLOFs) – IPL Project No. 179. **Landslides** 11(1):161-165.
 - Emmer A, Vilímek V (2014) New method for assessing the susceptibility of glacial lakes to the outburst floods in the Cordillera Blanca, Peru. **Hydrology and Earth System Sciences**, 18:3461-3479.
 - Emmer A., Klimeš J., Mergili M., Vilímek V., Cochachin A. (2016): 882 lakes of the Cordillera Blanca: An inventory, classification, evolution and assessment of susceptibility to outburst floods. **Catena**, 147, 269-279.
 - Klimeš J., Novotný J., Novotná I., Jordán de Urries, Vilímek V., Emmer A, Strozzi, T, Kusák M., Rapre, A.C., Hartvich, F. Frey, H (2016): Landslides in moraines as triggers of glacial lake outburst floods: example from Palcacocha Lake (Cordillera Blanca, Peru). **Landslides**, 13, 6, 1461-1477.
 - Emmer A., Vilímek V., Huggel C., Klimeš J., Schaub Y. (2016): Limits and challenges to compiling and developing a database of glacial lake outburst floods. **Landslides**, 13, 6, 1579–1584.