

IPL Project Annual Report Form 2022

1 January 2022 to 31 December 2022

1. Project Title

The construction of a global database of giant landslides on oceanic island volcanoes

2. Main Project Fields

Select the suitable topics. If none are suitable, you may add new a field.

(1) Technology Development

Hazard Mapping, Vulnerability, and Risk Assessment

(2) Targeted Landslides: Mechanisms and Impacts

Catastrophic Landslides

(3) Capacity Building

Collating and Disseminating Information/Knowledge

(4) Mitigation, Preparedness, and Recovery

Preparedness

3. Name of Project Leader

Name: Dr. Matt Rowberry, Ph.D.

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Core team members: Dr. Jan Blahůt PhD, Dr. Jan Klimeš PhD, Dr. Michal Kusák, PhD (all IRSM CAS)

4. Objectives

The fundamental objectives of the project are:

- To construct the first global database of giant landslides on volcanic islands
- To investigate spatial and temporal patterns of landsliding and landslide reactivation
- To assess the hazard and potential risks posed by these giant landslides

5. Study Area

The database will include information about giant landslides from across the globe.

6. Project Duration

2016 onwards

7. Report

7.1 Progress in the project

Since the beginning of this project our activities have been presented in two manuscripts published in the journal *Landslides* and one chapter published in the book series *Progress in Landslide Research and Technology*. The first manuscript outlines construction of the georeferenced database, which was made on the basis of an exhaustive search of the scientific literature coupled with insights gleaned from altimetric and bathymetric models (Blahůt et al., 2018); the second manuscript uses the georeferenced database in order to measure the basic morphometric characteristics of each landslide and interrogate relationships between potentially significant morphological variables (Blahůt et al., 2019); and the book chapter illustrates the global distribution of giant landslides on volcanic islands and discusses the main benefits of landslide inventories and thematic databases (Rowberry et al., 2022). These manuscripts have been read widely by the landslide research community, with the SpringerLink website indicating 678 accesses and 20 citations for the first manuscript, 1 053 accesses and 28 citations for the second manuscript, and 1520 Accesses and 1 citation for the recently published book chapter in *Progress in Landslide Research and Technology*. The database itself can be downloaded from the project webpage either as a spreadsheet or as a kml file for integration in a number of geospatial programs including ArcGIS and Google Earth (Institute of Rock Structure and Mechanics, 2023). We continue to maintain and update the database as more information on giant landslides is published in the scientific literature.

7.2 Planned future activities or statement of completion of the project

Our objectives for the next twelve months are threefold:

- The global database of giant landslides on volcanic islands will continue to be reviewed and updated as more information about such events is published in the scientific literature. New additions will include the recent events on Anak Krakatau and Hunga Tonga-Hunga Ha'apai.
- A new database layer will be created to provide information about the long term monitoring of such landslides, irrespective of whether undertaken through direct instrumental measurements or remote sensing approaches.
- Create a new webpage in which a series of blog posts describe different data mining and machine learning approaches that can be applied to glean insights from the database using open source software such as Python and R.

7.3 Results

Blahůt, J., Balek, J., Klimeš, J., Rowberry, M., Kusák, M., Kalina, J., 2019. A comprehensive global database of giant landslides on volcanic islands. *Landslides*, v. 16, p. 2045-2052.

<https://doi.org/10.1007/s10346-019-01275-8>

Blahůt, J., Klimeš, J., Rowberry, M., Kusák, M., 2018. Database of giant landslides on volcanic islands - first results from the Atlantic Ocean. *Landslides*, v. 15, p. 823-827.

<https://doi.org/10.1007/s10346-018-0967-3>

Institute of Rock Structure and Mechanics, 2023. Database of Giant Landslides on Volcanic Islands.

Institute of Rock Structure and Mechanics, Czech Academy of Sciences:

<https://www.irms.cas.cz/ext/giantlandslides> [last accessed 6 April 2023]

Rowberry, M., Klimeš, J., Blahůt, J., Balek, J., Kusák, M., 2022. A global database of giant landslides on volcanic islands. In: Sassa, K., Konagai, K., Tiwari, B., Arbanas, Ž., Sassa, S. (eds.), Progress in Landslide Research and Technology, Vol. 1, Issue 1, p. 295-304.

https://doi.org/10.1007/978-3-031-16898-7_22.

Note:

- 1) If you change items 1-6 from the proposal please write the revised content in Red.
- 2) Please fill and submit this form by 17 April 2023 to ICL Network <icl-network@iclhq.org>