

Date of Submission	
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IPL Project (IPL-Number) Annual Report Form

**Period of activity under report
from 1 January 2022 to 31 December 2022**

1. Project Number and Title:

IPL-238 Landslides Threatening Russian Cultural Heritage Sites

2. Main Project Fields

Select the suitable topics. If no suitable one, you may add new field.

(2) Targeted Landslides: Mechanisms and Impacts

A. Catastrophic Landslides

3. Name of Project Leader

Gorobtsov Denis N.

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Core members of the Project

Igor Fomenko – Ph.D., professor of engineering geological department of Russian State geological Prospecting University;

Daria Shubina – master, Senior Lecturer of engineering geological department of Russian State geological Prospecting University;

Margarita Novgorodova – master, Lecturer of engineering geological department of Russian State geological Prospecting University.

4. Objectives: Development and approbation of the landslides modeling methodology within historical natural-technical systems.

5. Study Area: different objects of Russian cultural heritage, including UNESCO cultural heritage sites.

6. Project Duration: 4 years

7. Report

1) Progress of the project:

In 2022, the project participants continued to work on several large projects to study landslides at once. Several articles have been published on landslide load assessment, instrumental

monitoring and landslide forecasting. The results of a large amount of work complement the database needed to systematize information about landslides at historically significant sites. Thus, the project participants continue to work on the formation of a knowledge system about the features of the development of landslides within the framework of historical natural and technical systems, which was outlined in the work plan.

2) Planned Future Actions or Project Completion Statement

To date, under the guidance of I.Fomenko, postgraduate student Binh Duong has prepared for the defense of his PhD thesis. It is planned to evaluate the impact of the resolution of the digital elevation model on the assessment of landslide hazard using the example of one of the landslides. In 2023, participants are going to take part in the field season to study the formation of large landslides.

- 3) Project beneficiaries for science, education and/or society: Ministry of Culture of the Russian Federation, Russian Orthodox Church, UNESCO
- 4) Results: Modeling and assessment of the stability of landslides of various types and scales, instrumental monitoring. Performing a local landslide hazard assessment using Scoops3D. Application of GIS-based statistical methods to assess the potential development of landslides. Landslides are regionally located: Sparrow Hills, Moscow; Mzymta River Valley, Sochi Region, Russia; Chung Chai commune (Sha Pa, Vietnam); Nurek district, Tajikistan.