

ICL Network Annual Report Form 2017

1 January 2016 to 31 December 2016

1. Project Title of Network:

Landslides and Cultural & Natural Heritage Network

2. Name of coordinators (Affiliation and emails)

Daniele Spizzichino (daniele.spizzichino@isprambiente.it); Vit Vilimeck (vit.vilimek@natur.cuni.cz) and Claudio Margottini (claudio.margottini@gmail.com).

3. List of member organizations:

Dr. D. Spizzichino, ISPRA, Geological Survey of Italy

Dr. C. Margottini, ISPRA, Geological Survey of Italy

Prof. V. Vilimek, Charles University in Prague, Faculty of Science, Dept. of Physical Geography and Geo-ecology

Prof. J. Vlko, Bratislava University, Slovak Republic

Prof. Y. El Saieb, Cairo University, Egypt

Prof. D. Karnawaty, Gadjah Mada University, Indonesia

Prof. N. Casagli, University of Florence, Italy

Dr. P. Bobrowsky, Geological Survey of Canada

Dr. Nikoloz Vacheishvili, National Agency for Cultural Heritage Preservation of Georgia, Georgia

4. Progress report of activities up to 31 December 2016

During the 2016 the network had the continuation of many international activities. Among them can be mentioned:

- **The conservation of the Byzantine Monastery of Vardzia (Georgia); the consolidation of some unstable blocks and the mesh installation were successfully completed.**

New field mission were planned for the next year in order to continue the mitigation and monitoring activities.

- **The project “Strengthening the Conservation and Management of Lumbini, the birthplace of lord Buddha, the World Heritage property (Phase II) - *Mayadevi* Temple and Archaeological Remains.**

The Temple is currently suffering for the rising dampness into the foundation and general weathering of the masonry bricks. The project is still in progress.

- **“Preservacion y Conservacion de Tiwanaku y la piramide de Akapana, Bolivia”.**

The project (still in progress) includes geological, geomorphological and geotechnical study of the instability processes affecting the pyramid.

- **Slope stability monitoring at Machu Picchu (Peru)**
- **Glacial lake outburst flood hazard evaluation in Huascarán National Park (Cordillera Blanca, Peru)**

The research in the National Park Huascarán (UNESCO World Heritage) is represented here by 10 years of research about Glacial Lake Outburst Floods (GLOFs) dedicated to the Cordillera Blanca in Peru. Apart of different case studies dealing with hazardous GLOF events we tried to solve also some more general topics: inventory of lakes in Cordillera Blanca, new methodology for hazard evaluation and establishing of GLOFs database (IPL project). We also tried to sum all different parameters which influence the GLOFs hazard evaluation (including landslides).

- **PROTEHGO PROtection of European Cultural HERitage from GeO-hazards.**

The project (still in progress) aims to make an innovative contribution towards the analysis of geo-hazards in areas of cultural heritage in Europe using satellite monitoring techniques. IPL project.

5. Plan of future activities

All activities will continue for the next year

6. Publication (in Landslides, proceedings, meeting reports, or WEB)

- C. Margottini, G. Gigli, H. Ruther and D. Spizzichino. *Advances in Sustainable Conservation Practices in Rupestrian Settlements Inscribed in the UNESCO's World Heritage List*. Article in *Procedia Earth and Planetary Science* 16:52-60 · December 2016 DOI: 10.1016/j.proeps.2016.10.006 · License: CC BY-NC-ND 4.0.
- K. Themistocleous, B. Cuca, A. Agapiou, V. Lysandrou, M. Tzouvaras, D. G. Hadjimitsis, P. Kyriakides, D. Kouhartsiouk, c. Margottini, D. Spizzichino, F. Cigna, G. Crosta, P. Frattini and J.A.M. Merodo. *The Protection of Cultural Heritage Sites from Geo-Hazards: The PROTHEGO Project*. Conference Paper October 2016 DOI: 10.1007/978-3-319-48974-2_11 · Conference: Euromed 2016, At Nicosia Cyprus, Volume: Part II.
- D. Spizzichino, C. Margottini, V. Chiessi and D. Boldini. *Assessment of the stability conditions of a large-volume sandstone block in the northern sector of the Siq of Petra*. Chapter June 2016. DOI: 10.1201/b21520-231. In book: *Landslides and Engineered Slopes. Experience, Theory and Practice*, pp.1851-1858
- 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.
- Vilímek V. (2016): *Preface for the thematic issue “Glacial Lake Outburst Floods”*. *Landslides*, 13, 6, 1323-1323.