

Landslides

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3rd Regional Symposium on Landslides in the Adriatic--Balkan Region (3rd ReSyLAB)—a final report

Abstract The 3rd Regional Symposium on Landslides in the Adriatic-Balkan Region (3rd ReSyLAB) was held in Ljubljana, Slovenia, from June 11 to 13, 2017, with 70 participants from nine countries (Austria, Bosnia and Hercegovina, Croatia, Czech Republic, Italy, Republic of Macedonia, Serbia, Slovenia, Spain)—scientists, engineers, researchers, students, experts, politicians, and other decision-makers working in the area of landslide risk reduction in the region. The ReSyLAB is a biannual event organized by the Adriatic-Balkan Network of the International Consortium on Landslides (ICL ABN). Being an important form of activities of this ICL regional network comprising of six ICL members from four countries, it was also a contribution of the International Consortium on Landslides (ICL) to the implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030. This article reports on the main outcomes of the 3rd ReSyLAB Symposium. Altogether, 41 abstracts were published in the symposium book of abstracts, and the symposium proceedings with over 20 reviewed full papers are under preparation to be printed early in 2018. During the 3rd ReSyLAB, a five invited keynote lectures have been presented, and 28 oral presentations are given to the audience. An important part of the symposium was a Round Table entitled “Enhancing cooperation between landslide research community and end users.” On the last day of the symposium, over 30 experts participated in two post-symposium study tours in Slovenia.

Keywords International Consortium on Landslides (ICL) · International Programme on Landslides (IPL) · Regional networks · Adriatic-Balkan Network · Sendai Framework

Introduction

A Regional Symposium on Landslides in the Adriatic-Balkan Region is a biannual event, organized by the Adriatic-Balkan Network of the International Consortium on Landslides (Kyoto, Japan). The 3rd ReSyLAB in Ljubljana 2017 (Jemec Aulfič et al. 2017b) followed two previous successful symposia in Zagreb (1st ReSyLAB 2013; Mihalić Arbanas et al. 2012) and Belgrade (2nd ReSyLAB 2015; Sassa et al. 2015). A regional symposium aims at strengthening the cooperation of the ICL members in the region and among the network of stakeholders involved in landslide research and landslide risk reduction (Mihalić Arbanas et al. 2012; Sassa 2017).

Organizers, organizing committee, and sponsors

The 3rd ReSyLAB was organized under the honorary patronage of the Ministry of Education, Science and Sport, Slovenia.

Organizers

The organizers are as follows: ICL Adriatic-Balkan Network (ICL ABN), Geological Survey of Slovenia (GeoZS), and the University of Ljubljana (UL—Faculty of Natural Sciences and Engineering and Faculty of Civil and Geodetic Engineering).

Chairpersons

The chairpersons are as follows: Mateja Jemec Aulfič (Geological Survey of Slovenia), Timotej Verbovšek (University of Ljubljana, Faculty of Natural Sciences and Engineering), and Matjaž Mikoš (University of Ljubljana, Faculty of Civil and Geodetic Engineering).

International scientific committee

It was composed of 33 members, comprising of ICL ABN members and other internationally recognized scientists in the field of landslide research and landslide risk reduction.

Local organizing committee

It was composed of seven members from the Slovenian ICL members (Geological Survey of Slovenia (GeoZS)) and University of Ljubljana (UL—Faculty of Natural Sciences and Engineering and Faculty of Civil and Geodetic Engineering).

3rd ReSyLAB sponsors

The 3rd ReSyLAB sponsors are the following: TRUMER Schutzbauten GmbH, GEOINVEST, EHO projekt, Geobrugg AG, Geoportal, Geotech, Tempos, 3Dsurvey, Slovenian Geological Society.

General information

The main objective of the symposium was to provide a stimulating forum for geoscientists, engineers, professionals, and decision-makers concerned with landslide hazards and risks as well as their impact on society—in the Adriatic-Balkan Region as well as worldwide. Symposium participants had an opportunity to present papers related to mapping, investigating, monitoring, analysis, and mitigation of landslides, as well as case studies on innovative analysis techniques and solutions in their oral presentations.

The main topics of the 3rd ReSyLAB were as follows:

- Mapping and Spatial Analyses
- Hazard Zoning and Risk
- Monitoring Techniques and Warning Systems
- Landslide Mechanics and Simulation Models
- General Case Studies
- Remedial Measures and Effects
- Social, Political and Economic Impact

Seventy participants, including 3 exhibitors, 31 side-event participants, and 7 members of the local organizing committee attended the 3rd ReSyLAB that was held at the University of Ljubljana and Faculty of Civil and Geodetic Engineering in Ljubljana, Slovenia, on 11 October–13 October 2017. Further details on the 3rd ReSyLAB participants are given in Table 1 (Fig. 1).

Table 1 The list of total 70 registered 3rd ReSyLAB participants

No.	Country	Participants
1	Austria	5
2	Bosnia and Hercegovina	1
3	Croatia	16
4	Czech Republic	1
5	Italy	6
6	Republic of Macedonia	1
7	Serbia	5
8	Slovenia	34
9	Spain	1

The international scientific committee reviewed 42 abstracts on the before-mentioned topics and accepted 41 abstracts that were published in the symposium book of abstracts, and the symposium proceedings with over 20 reviewed full papers are under preparation to be printed early in 2018.

Symposium opening

The opening of the Symposium took place at the University of Ljubljana on 11 October 2017 started by the opening ceremony, given by the following keynote speakers:

- Miloš Bavec, Director of Geological Survey of Ljubljana
- Igor Papič, Rector of University of Ljubljana
- Matjaž Mikoš, Vice President of International Consortium of Landslides
- Snježana Mihalić Arbanas, Coordinator of the ICL ANB Network

The opening addresses were followed by introductory presentations held by the invited keynote speakers:

- Veronica Tofani, Department of Earth Sciences of the University of Florence, Italy (Landslide monitoring and rapid mapping)
- Lisa Borgatti, University of Bologna, Italy (From slow to fast. Modelling, monitoring and mitigating Deep-seated Gravitational Slope Deformations)
- Miloš Bavec, Geological Survey of Slovenia (Recent Developments in landslide research in Slovenia)

Technical sessions

During the Symposium, all authors presented their contributions as oral presentations and these were divided into five sessions. First session took place on 11 October and started with a keynote lecture on *Analysis of Rainfall Preceding Debris Flows on the Smědavská hora Mt., Jizerské hory Mts., Czech Republic*, presented by Vit Vilímek. Other sessions followed on 12 October and started with the keynote lecture of Gerardo Herrera with the title of *Towards a pan-European landslide database from the Geological Surveys*. Each session comprised six presentations, with time for a joint discussion.

The closure of symposium was given by Željko Arbanas (Co-Coordinator of the ICL ABN Network) and Mateja Jemec Aulfič (Chair of the 3rd ReSyLAB). They emphasized that the 3rd ReSyLAB achieved the expectations, and a step forward was done towards what is being described in the Sendai Partnerships 2015–2025 and the 2017 Ljubljana Declaration.

Round Table “Enhancing cooperation between landslide science community and end users”

The Round Table panelists were 12 invited landslide scientists and administration officers from academic and research institutions, state and local administration, and civil protection authorities from Bosnia and Hercegovina, Croatia and Slovenia, chaired by Matjaž Mikoš from Slovenia. Following the 2015 ISDR-ICL Sendai Partnerships 2015–2025 for Global Promotion of Understanding and Reducing Landslide Disaster Risk and the 2017 Ljubljana Declaration on



Fig. 1 Present participants during the opening ceremony of the 3rd ReSyLAB at the University of Ljubljana



Fig. 2 Stogovce landslide, a stop on the study tour “Landslides in the Vipava Valley”

Landslide Risk Reduction, the Round Table explored possible ways of enhancing cooperation between the landslide science community and end users, discussed priorities for future practical applications derived from scientific basic and applied research, and possibilities how to apply available geoenvironmental data and information in land-use planning, civil and environmental protection, and further development of legislation documents, such as guidelines and decrees.

The Round Table discussion formally covered the following topics:

- (1) Disaster risk factors and scenarios, including emerging disaster risks, in the medium and long term;
- (2) Enhance research at local, regional, and the national scale;
- (3) Support actions by local communities and authorities; and

- (4) Support decision-making with interaction between policy makers and the scientific community.

Following on from what the invited panelists said the main conclusions of the Round table were as follows:

- (1) a common landslide cadaster/database for each country in the region is strongly needed for accepting landslide hazard and risk maps and to develop early warning systems to be used by spatial planners and civil protection;
- (2) to find a proper strategy for technologies and landslide knowledge transfer to the variety of end users is vital;
- (3) enhancing endeavor that policy makers will adopt strategies for landslide risk reduction in their decisions.



Fig. 3 Participants in the study tour “Potoška planina landslide”

- (1) The Round Table was combined by a Press Conference for the local media from Slovenia.

Side events

During the 3rd ReSyLAB, a side event was organized:

- A selection of 24 photographs from the WLF4 Landslide Photo Contest “Landslides and Mankind” (Mikoš et al. 2017) was exhibited in the main Building of the Faculty of Civil and Geodetic Engineering of the University of Ljubljana. The exhibition stayed open to public for two weeks.

The 3rd ReSyLAB study tours

The Symposium concluded with two interesting field study tours: “Landslides in the Vipava valley” and “Potoška planina landslide.”

The first study tour “Landslides in the Vipava Valley” focused on the variety of landslides in the Vipava Valley, including both geological and geotechnical topics. Study tour comprised four stops: landslides Slano blato and Stogovce near the town of Ajdovščina, karstic spring Hubelj, and nearby fossil landslide Gradiška gmajna and landslide Podboršt in the Razdrto–Vipava highway region. Study tour took place as a part of IPL-216 project entitled “Diversity and hydrogeology of mass movements in the Vipava Valley, SW Slovenia” (Fig. 2). More information can be found in Jemec Auflič et al. (2017a).

Study tour “Potoška Planina Landslide” took place as a part of IPL-188 project entitled “Study of slow moving landslide Potoška Planina.” Potoška planina landslide is situated in the NW Slovenia, in the Karavanke mountain ridge, near the town Jesenice. During the field trip, we observed surface features, different types of slope mass movements, and real-time monitoring techniques. More detailed about the Potoška planina landslide can be found in Peternel et al. (2017) (Fig. 3).

Conclusions

During the symposium, several new-advanced technologies for landslide monitoring have been presented. Furthermore, many landslides exist in the ABN region triggered mainly by intensive or prolonged rainfall and caused material damage and human casualties. Researchers are active on the field of landslide investigations, monitoring, early warning system, and collecting the landslide data as well on the remediation. The main drawbacks are financial resources and inadequate legislation. The fact is that landslides cannot be entirely avoided, but with the proper land intervention that based on the landslide risk zones, we can minimize the damage and prevent society. In the next following years, the ICL ABN will look forward to joint projects tackle and contribute to research improvement and putting knowledge and experiences into practice.

More information about the 3rd ReSyLAB held in Ljubljana (Slovenia) 11–13 October 2017 can be found at the symposium website at: www.geo-zs.si/ReSyLAB2017.

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