



## Progress of the World Report on Landslides

Biljana Abolmasov, Teuku Faisal Fathani, KoFei Liu, and Kyoji Sassa

### Abstract

The IPL World Reports on Landslides (WRL) database is created as a cooperation platform for sharing landslide case studies and the best practice in the global landslide community. ICL and IPL wishes to promote and publish global landslide information using the ICL/IPL network for the ISDR-ICL Sendai Partnership 2015–2025 and the Sendai Framework for Disaster Risk Reduction 2015–2030 through WRL activities were assigned as one of priority action. World Report on Landslides data base contains 40 submitted reports on landslide cases over the world. The best rating reports are accessible for world-wide landslide community as open access data, as well as all basic reports. In this paper results of ICL/IPL World Report on Landslides Commitee members and related activities from 2010 to 2016 are presented.

### Keywords

Landslides • ICL • IPL • Sendai partnership • UNISDR

### Introduction

The International Consortium on Landslides (ICL) and International Program on Landslides (IPL) created web data base and web cooperation platform for sharing information about landslide case studies in the global landslide community. The idea of World Report on Landslides (WRL) was

first examined in the ICL-IPL Secretariat meeting held on January 2010 in Kyoto, Japan. The WRL web portal and the instruction for authors were launched before the ICL-IPL meeting in November 2010. The portal and Instruction for authors were further examined in the ICL-IPL meeting during 2nd World Landslide Forum in Rome, Italy, 2011. The idea of Sendai Partnership 2015–2030 at 3rd World Conference on Disaster Risk Reduction (WCDRR) as well as Beijing Declaration during 3rd World Landslide Forum 2014 were built and ICL coordinator for WRL was elected. After ICL Steering Committee meeting KoFei Liu started to manage WRL with Faisal Fathani as web moderator in October 2014. At the 3rd WCDRR which was convened by the United Nations and hosted by Japan in Sendai from 14 to 18 March 2015, the ICL and its IPL, besides *The Sendai Partnership 2015–2030 for Global Promotion of Understanding and Reducing Landslide Disaster Risk*, contributed further to the UN International Strategy for Disaster Reduction with additional three main types of activities:

- Publication of ICL *Landslides Journal* to communicate frontier of Landslide Science and Technology

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- Publication of *Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools* for Education and Capacity development and
- IPL web portal for *World Report on Landslides* to inform global landslide community about world-wide landslide case studies, thereby promoting research cooperation within ICL members through IPL web platform.

ICL and IPL wishes to promote and publish global landslide information using the ICL and IPL network for the ISDR-ICL Sendai Partnership 2015–2025 and the Sendai Framework for Disaster Risk Reduction 2015–2030 through WRL activities were assigned.

Progress of WRL activities was reported on ICL-IPL Kyoto Conference in March 2016 and followed by activities with Kyoji Sassa during March–October 2016. The Chair of WRL Committee was replaced by Biljana Abolmasov (University of Belgrade, Serbia) and Deputy Chairs are KoFei Liu (National Taiwan University, Chinese Taipei) and Teuku Faisal Fathani (University of Gadjah Mada, Indonesia). Core members of WRL are Khang Dang (ICL research promotion officer, Kyoto University, Japan) and Miloš Marjanović (University of Belgrade, Serbia). The WRL activities were presented and examined during ICL-IPL UNESCO Conference 15–18 November 2016 within ICL members.

In this paper results of ICL/IPL World Report on Landslides Committee members and related activities from 2010 to 2016 are presented.

## World Report on Landslides

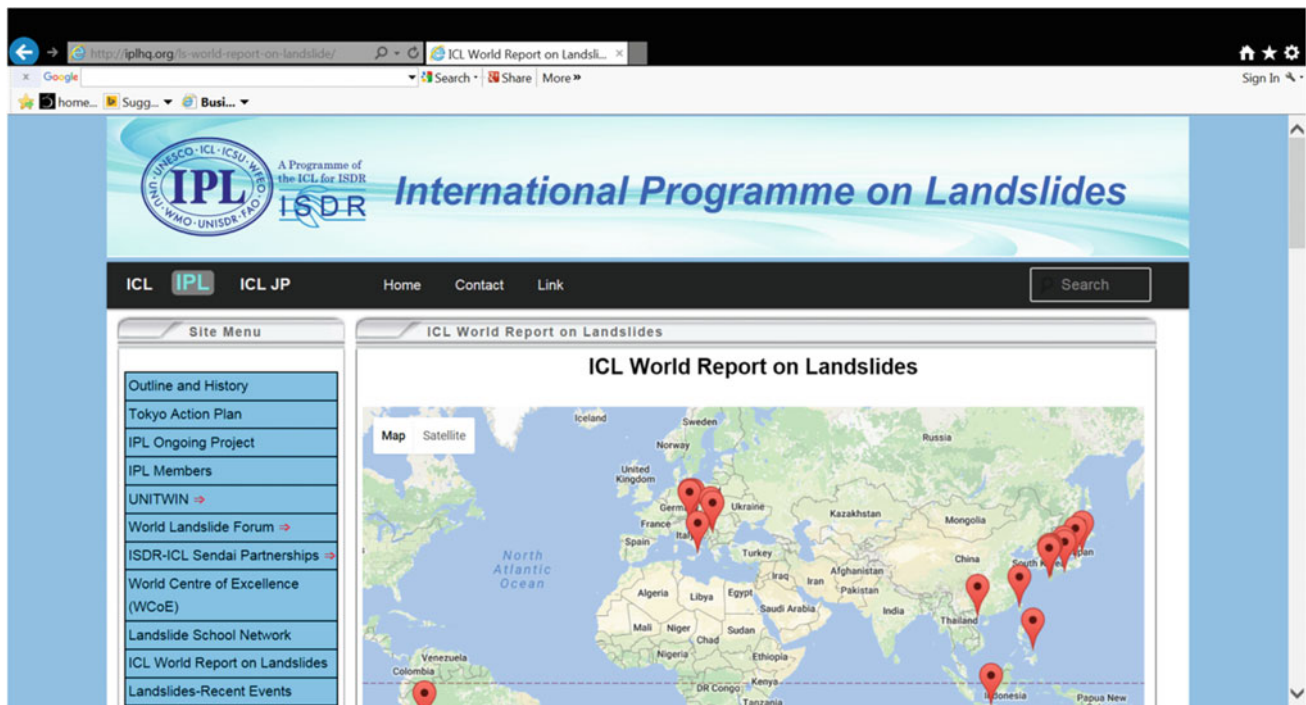
The IPL World Reports on Landslides (WRL) database is created as a cooperation platform for sharing landslide case studies and the best practice in the global landslide community. The reports may be used for research and capacity development in landslide risk reduction activities in the frame of the United Nations International Strategy for Disaster Reduction (UNISDR). Generally, everyone is welcome to contribute landslide case studies in this WRL database as the reporter. Landslide experts of ICL members and colleagues are invited to contribute landslide cases over the World Reports on Landslides at IPL web page <http://iplhq.org/ls-world-report-on-landslide/> (Fig 1).

## Instruction for Authors

This instruction provide explanation of items in Data Sheet for World Report on Landslides. Every report should be prepared according to the unified data information:

1. Landslide Case Identifier (LCI)—Each registered landslide case has its own Identifier number. Number consists of three letter country code (ISO 3166-1 alpha-3) and year/date/time of submission (Example: JPN1512101230).
2. Location of landslides—Unit of latitude and longitude should be in degree/minute/second. It is possible to find the latitude and longitude of reporting landslide by using the Google earth.
3. Authors—Office and Address are necessary to identify the authors.
4. Landslide Types—Types of movements and material involved are illustrated in *The Landslide Handbook—A Guide to Understanding Landslides* (Highland and Bobrowsky 2008), IPL Project 106.
5. Velocity—velocity range which is estimated or guessed as the maximum speed range of reporting landslide (extremely rapid, very rapid, rapid, moderate, slow, very slow and extremely slow, unknown) has to be selected.
6. Slope—range of slope which is measured or guessed for the case (extremely steep, very steep, steep, moderate, gentle, very gentle and almost flat, unknown) has to be selected.
7. Depth—depth range which is measured, estimated or guessed for the reporting landslide (extremely deep, very deep, deep, moderate, shallow, very shallow, extremely shallow, unknown) has to be selected.
8. Volume—volume range which is estimated or guessed for landslide reporting (extremely large, very large, large, large-moderate, moderate-small, small, very small, unknown) has to be selected.
9. Activity—data about landslide occurrence has to be filled in if known: Date of occurrence: Day/Month/Year and state of activity (currently active, active in the past) or unknown. If the landslide is moving slowly or repeatedly moves, it can be classified as currently active.
10. Triggering factors—one or more triggers (rainfall, earthquake, snow melting, erosion, human activities, others, unknown) have to be selected.
11. Damage—Damage is presented as number of death(s) and/or missing persons, houses and other structural damage and economical loss if estimated.
12. Land use—Land use should be explained for source area and run-out/deposition area (forest, farming, pasture, wildland, urban area, human settlement, industrial use, road, railways, sea/lake, river, cultural heritage site).
13. Description—It has to be provided summary for reporting landslide and reference paper.

In addition, the reporter is asked to provide further information on landslide case as attachment files such as photo, map, plan and cross section, figures or simulation video.



**Fig. 1** Screenshot of world report on landslides web page <http://iplhq.org/ls-world-report-on-landslide/>

Instruction for authors is available at <http://iplhq.org/icl/wp-content/uploads/2016/02/1.-Instruction-for-WRL-Final.doc>.

## Guide to Submit Report

Before reporting landslide cases, authors need to register with the registration form. The system will send ID and password via email. After registration, authors need to login to input data for reporting landslide. After login, reporter will be redirected to landslide report submission form. To submit landslide report, reporter have to fill in the Report Form personal information (Email address, First Name, Last Name, Country and Institution) and landslide data (Landslide name, Landslide Case Identifier and other relevant data). After filling in the necessary fields, reporter have to submit report to save into database. On successful submission reporter will see success notification within green box on top of the page.

Guidelines on report submission are available at <http://iplhq.org/icl/wp-content/uploads/2016/02/2.-Guide-to-submit-reports.docx>.

## Rating and Accessibility

Each report is rated by 7 components (basic information, plan/section, reference, graphics and other resources)

attached to the report (Table 1). WRL report is rated by the total rating points from 1 to 7, so that each component brings 1 point. Each report is categorized from ★1 to ★7, depending on the sum of rating points. ICL earning points are then calculated as a total sum of all accepted reports given by one reporter. Reporter earns accessibility to other reports by earning sufficient amount of these ICL points. However, ★1 report is open for everyone, while access to other reports from ★2 to ★7 requires ICL earning points obtained by accepted reports, except open access reports (high category reports assigned by the WRL Committee). Report can be submitted by one or maximally two reporters, and their names are shown in the ICL-WRL web portal. In the case of two authors, both will obtain the same amount of ICL points (from one to seven) for their report. It is important to notice that is necessary to obtain signed authorisation sheet from both reporters to avoid any plagiarism of WRL report.

Rating and accessibility of WRL is available at <http://iplhq.org/icl/wp-content/uploads/2016/10/3.-Rating-and-Accessibility-of-WRL-16.10.20.doc>.

## Progress of the World Report on Landslides

Web platform and data base of IPL World Report on Landslides are functionally operated since 2010, but during 2016 additional improvements of visibility and more

**Table 1** Rating points of each component on landslide report

Components	Rating point
Basic information (location/reporting items/description/photo/Google earth kmz. file	1
Plan of landslide pdf, image	1
Cross section of landslide pdf, image	1
Reference (paper/report) link	1
Testing graphics in pdf, image	1
Monitoring graphics in pdf, image	1
Video of moving landslides including 3D simulation link	1

functionality are established. The Instruction for Authors, Guide to Submit Report and Rating and Accessibility information were revised and in the revised version linked to IPL web page. The procedure for submitting, revision and publishing responsibilities were discussed during autumn 2016. Summary report of those activities was presented on ICL/IPL meeting in UNESCO, Paris in November 2016.

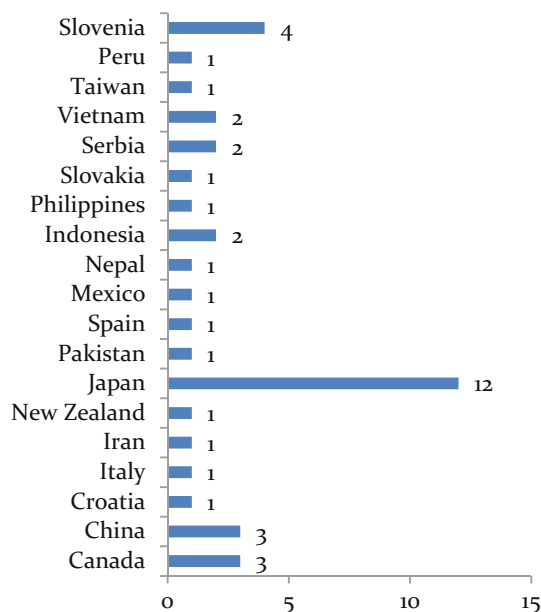
Up to now (December 15 2016), the World Report on Landslides database contains 40 submitted reports on landslide cases over the world (Fig. 2). Seventeen of these reports are still not published (waiting for authorization), while 23 of them are available on the web platform (Table 2). The most of reports are rated as more than ★5, which means that almost all components are included in the report. One published report is rated as ★1 which means that only basic landslide information is provided. The simple analysis of reported landslides and their distribution according to the obtained rating points are given in Fig. 3.

The analysis of reports by country origin shows that the highest number of WRL (uploaded or published) originated

from Japan (45%), (<http://www.iplhq.org/>) and (Fig. 3). Four of reports with highest obtained points ★7 and ★6 are also from Japan, two with point ★6 are from Serbia and Croatia, and one with rating ★5 is from Vietnam, respectively (Table 2 and 3).

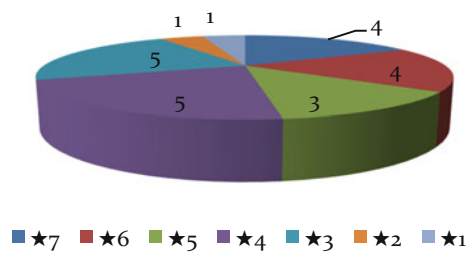
The main idea of Committee members is to share landslide basic information from landslide reports with rating points ★1 for everyone. The best rating reports in the WRL data base are free accessible for everyone too, as an example of best practice and support for promotion and cooperation activities between ICL members and world landslide community. The list of open access WRL reports are listed in Table 3.

An example of free access of World Report on Landslides is 1792 Unzen-Mayuyama landslide which killed around 15.000 people by landslide and landslide induced tsunami. The following Figures shows geographical position of landslide (Fig. 4); cross section of landslide (Fig. 5); testing data from samples taken from landslide (Fig. 6) and Screenshot of video simulation results (Fig. 7) uploaded on YouTube <https://www.youtube.com/watch?v=GwAWjdXXNbk>.

**Fig. 2** Total of uploaded reports distribution by country

**Table 2** The list of published world report on landslides on IPL web platform

	ID	Title	Reporters	Country	Points
1.	2305	Kalitelaga landslide	Bintri Simbolon, Faisal Fathani	Indonesia	★3
2.	2306	Ledoksari landslide	Tasdiq Hasan, Dwikorita Karnawati	Indonesia	★3
3.	3299	Leyte landslide	Pham Tien, Kyoji Sassa	Philippines	★4
4.	3321	Unzen-Mayuyama megaslide	Khang Dang, Kyoji Sassa	Japan	★7
5.	3322	Minamata debris flow	Khang Dang, Kyoji Sassa	Japan	★4
6.	3323	Spis castle landslide	Khang Dang, Jan Vlcko	Slovakia	★4
7.	3324	Tsukidate landslide	Khang Dang, Hiroshi Fukuoka	Japan	★2
8.	3325	Qianjiangping landslide	Khang Dang, Fa-Wu Wang	China	★4
9.	3326	Nikawa landslide	Khang Dang, Kyoji Sassa	Japan	★6
10.	3403	Leva Reka landslide	Milos Marjanovic, Biljana Abolmasov	Serbia	★1
11..	3405	Kostanjek landslide	Martin Krkac, Snjezana Mihalic Arbanas	Croatia	★6
12.	3406	Takanodai landslide	Khang Dang, Kyoji Sassa	Japan	★7
13.	3407	Aso-ohashi landslide	Khang Dang, Kyoji Sassa	Japan	★7
14.	3408	Umka landslide	Biljana Abolmasov, Svetozar Milenkovic	Serbia	★6
15.	3423	Ha Long landslide	Doan Loi, Quang Lam	Vietnam	★5
16.	3448	1792 Unzen landslide and Tsunami disaster	Khang Dang, Kyoji Sassa	Japan	★7
17.	3497	Haivan station landslide	Khang Dang, Quang Lam	Vietnam	★6
18.	3500	Juan Grijalva	Victor Manuel Hernandez-Madrigal, Juan Carlos Mora-Chaparro	Mexico	★4
19.	3476	Abbotsford landslide	Ha Nguyen Duc, Graham Hancox	New Zealand	★3
20.	3315	Aratozawa	Ha Nguyen Duc, Hendy Setiawan	Japan	★3
21.	3297	Kuridaira landslide dam	Pham Tien	Japan	★5
22.	3404	Akatani landslide dam	Pham Tien	Japan	★5
23.	3499	Sunkoshi landslide	Pham Tien	Nepal	★3

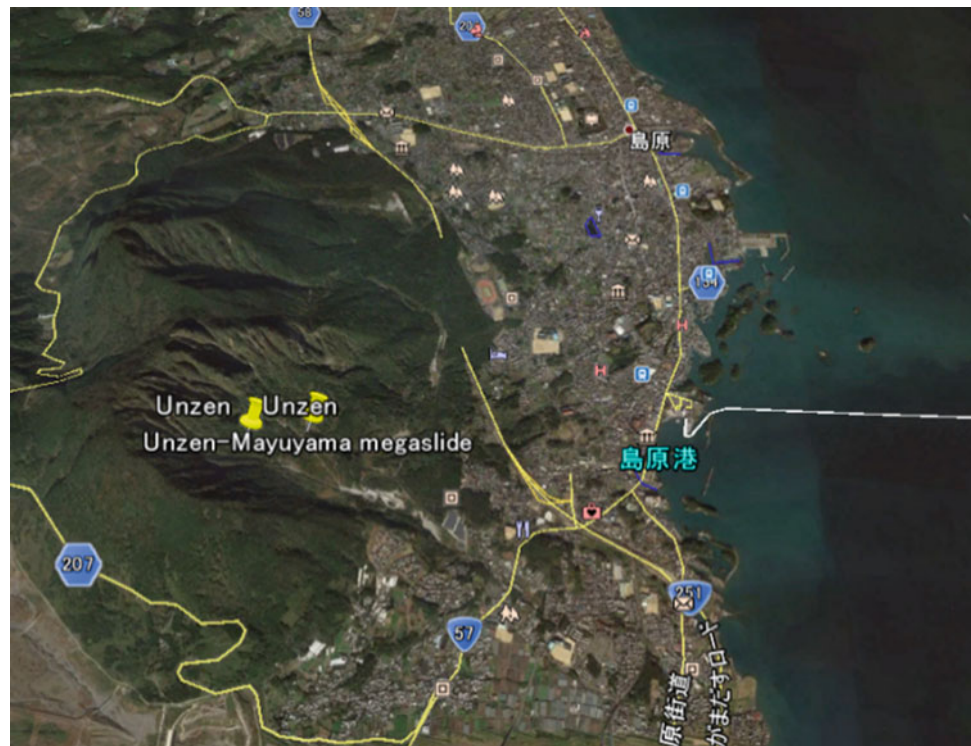


**Fig. 3** Number of published reports and their rating

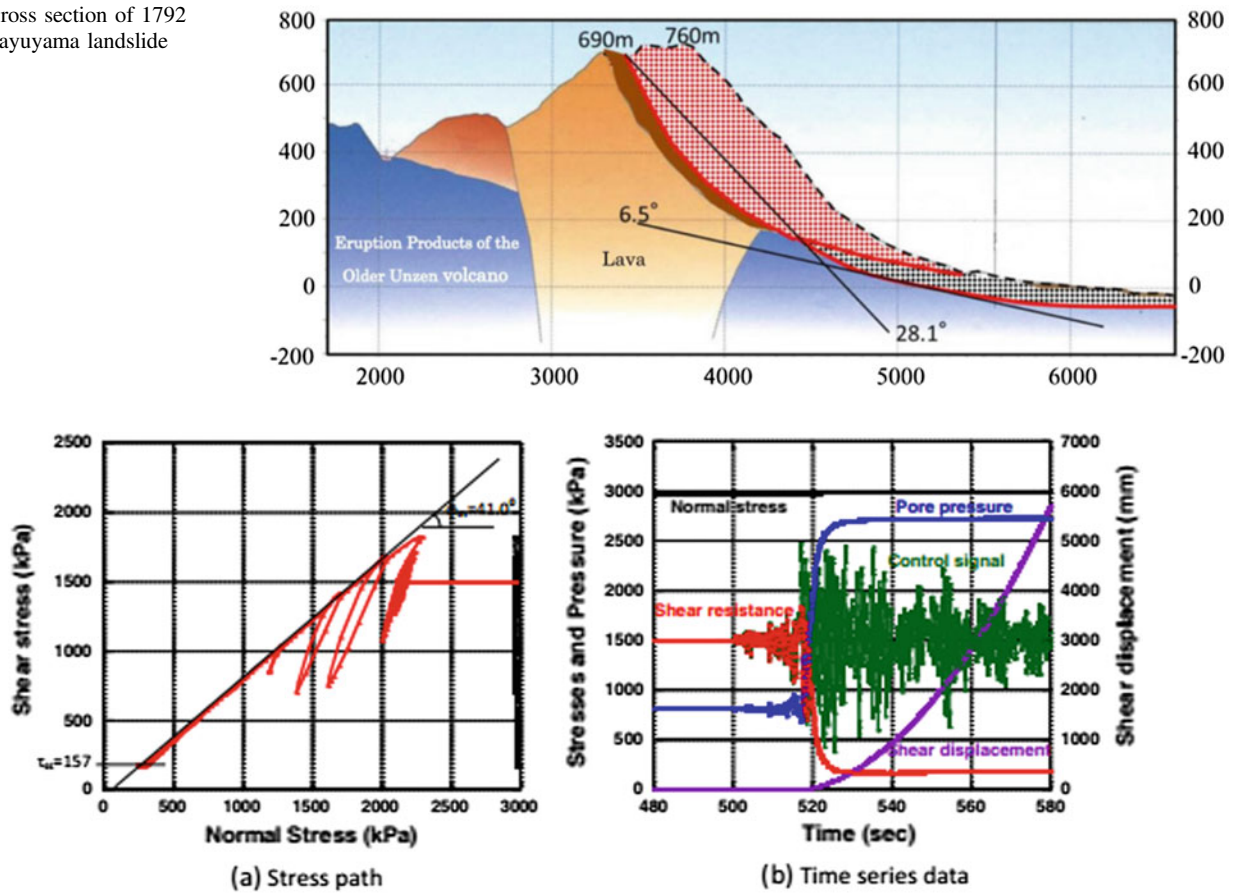


**Table 3** The list of open access world report on landslides on IPL web platform

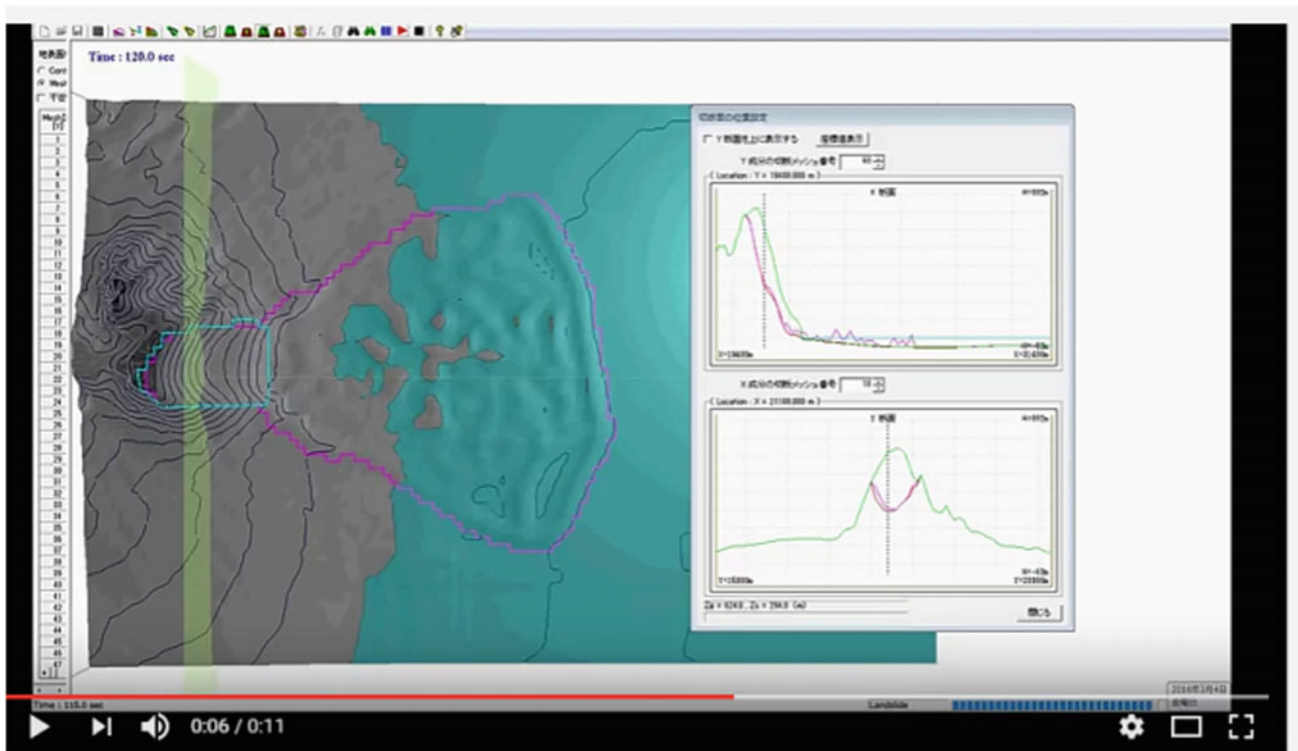
Landslide name	Location	Reporter(s)	Date of occurrence	Latitude	Longitude
1792 Unzen landslides and tsunami disaster LCI: JPN1611131539 Rating: ★7	Shimabara, Nagasaki, Japan	Khang Dang, Kyoji Sassa	May 21, 1792	32:46:13.24 N	130:30:0.82 E
Unzen-Mayuyama megaslide LCI: JPN1607121655 Rating: ★7	Shimabara, Nagasaki, Japan	Khang Dang, Kyoji Sassa	May 21, 1792	32:45:51.51 N	130:20:54.16 E
Kostanjek landslide LCI: HRV20160913 Rating: ★6	Zagreb, City of Zagreb, Croatia	Martin Krkac, Snjezana Mihalic Arbanas	Dec 02, 1963	45:49:20 N	15:51:24 E
Takanodai landslide LCI: JPN1609161455 Rating: ★6	Kawayo, Kumamoto, Japan	Khang Dang, Kyoji Sassa	Apr 16, 2016	32:53:4.66 N	131:0:15.14 E
Umka landslide LCI: SRB1616092150 Rating: ★6	Belgrade, Belgrade area, Serbia	Biljana Abolmasov, Svetozar Milenković	unknown	44:40:18.46 N	20:17:53.35 E
Ha Long landslide LCI: VNM161020844 Rating: ★5	HaLong, QuangNinh, Vietnam	Doan Loi, Quang Lam	Jul 28, 2015	20:57:29.91 N	107:6:10.26 E

**Fig. 4** Google earth kmz. file of Unzen landslide area, Japan

**Fig. 5** Cross section of 1792 Unzen-Mayuyama landslide



**Fig. 6** Testing results from samples taken from 1792 Unzen-Mayuyama landslide



**Fig. 7** Screenshot of simulation results video from 1792 Unzen-Mayuyama landslide uploaded on <https://www.youtube.com/watch?v=GwAWjdXXNbk>

## Conclusion

Open communication with society through integrated research and knowledge transfer are initial fields of cooperation in research and capacity building in the UNISDR-ICL Sendai partnership 2015-2025 Resolution. The ICL/IPL WRL data base and web platform are one of three major types of global ICL/IPL activities within voluntary commitment to the Sendai Framework for Disaster Risk Reduction.

ICL members and other landslide experts colleagues are invited to contribute landslide cases over the World Reports on Landslides at IPL web page.

Committee members support landslide reporting with a goal to:

- Increasing number of reports from over the world, generally (to share global information)
- Improving quality of reports in scientific and technical content (to share knowledge)
- Improving number of reports with high rating points (to share best practice data and examples) as free-open access data.

ISDR-ICL Partnership is focused on delivering information and practical results within landslides community that are directly related to the implementation of Sendai Framework for Disaster Risk Reduction. That ICL/IPL World Report on Landslide activities are promoting integrated research, knowledge transfer, education activities and capacity building in the coming years.

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## References

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<http://www.iplhq.org/>  
<https://www.youtube.com/watch?v=GwAWjdXXNbk>

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