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The bibliometric impact of books published by the International Consortium on Landslides

Abstract Dissemination of research results is an important part of basic as well as applied research if not the most important one. A large part of research results is published in scientific literature, and since there are many forms of it, the question arises which form is the most visible and attractive to the world scientific community. The International Consortium on Landslides (ICL), based in Kyoto, Japan, is one of the leading institutions in the field of landslide research and landslide risk reduction. On behalf of ICL, Springer Nature has published the journal *Landslides: Journal of the International Consortium on Landslides* since 2004. It is a very successful scientific journal with regard to its scientometric parameters. Since January 2018, it has been a monthly journal published in full color in electronic as well as printed form. Another form of dissemination of the ICL scientific and professional activities are published books in the form of monographs and proceedings from triennial World Landslide Forums. This paper discusses the impact of 52 books with 3426 chapters taken from the field of landslide science and published by Springer Nature from 2005 to 2018 in the earth sciences category, using different scientometric parameters, such as Bookmetrix downloads and citations, Scopus citations, Scopus h-index, Google citations, and Google h-index. The analysis was performed on the book chapter level (using mainly citations as the main scientometric parameter) as well as on the book level (using book h-index and percentage of cited chapters). Out of the selected 52 titles, 22 were published on behalf of the ICL, with 1419 chapters. The differences among landslide-related books can be quite large; only a few chapters from analyzed book titles were found to be cited frequently compared to highly cited scientific journal articles. On average, the analyzed 3426 book chapters from 52 landslide-related books have been downloaded since publication over 53,000 times each; 1092 chapters (32%) received 2932 citations (2.68 citations per cited chapter and 0.86 citations per published chapter). The analysis shows that the books published on behalf of the ICL are, together with other landslide-related book titles, on the forefront in the Springer eBook collection Earth and Environmental Science (EES). The selected 52 landslide-related book titles are above the average metrics for the whole EES with regard to the total number of downloads per book, the total number of citations per book, and the total number of readers per book. The ICL-related books are getting more downloads but less readers and citations (so far) as the selected non-ICL-related books. A way in raising the visibility and impact of the ICL books on landslide research community would be to support their open access publication in the form of e-Books as much as possible, and inclusion of ICL books into Web of Science.

Keywords Landslides · Risk dialog · Impact Factor · International Collaboration · Citations · Book metrics

Introduction

After years of roaring success for Open Access journals and article-level metrics, there is now a new wave of innovation from publishers, funding agencies, and universities assessment around books. For those in disciplines where the majority of research output is published as monographs, this likely comes as a relief. An increased number of books are annually indexed in citation databases, where we can gain insight into the citation behavior and longevity of books. All of these new developments give book authors and editors more credit for their hard work and offer new metrics for research assessments (Academic Book Week 2016).

Until 2004, there was only one widely used, comprehensive citation database, namely the ISI's (Institute for Scientific Information—later Thomson Reuters—now Clarivate Analytics) Web of Science (WoS). In fall of 2004, two new and therefore rival citation databases entered the bibliometric world: Elsevier's Scopus and the freely available Google Scholar (GS). Many studies have revealed differences between them, taking into account the coverage and the number of citations, and the differences were not the same for different scientific disciplines. For example, Kousha and Thelwall (2008) compared four science disciplines and found that GS might exhibit a certain advantage by securing wider coverage of non-journal documents especially a wider range of open access scholarly documents. Remarkable differences between the three aforementioned citation databases were confirmed by taking one book as a case study (Bar-Ilan 2010); the differences between WoS and Scopus were visible due to a fact that citations in Scopus are limited to the period of 1996 and onward.

Torre-Salinas et al. (2014) analyzed the disciplinary coverage of Thomson Reuters' Book Citation Index (BCI) database focusing on publisher presence, impact, and specialization. They have examined coverage by discipline, publisher distribution by field and country of publication, and publisher impact. For this purpose, the Thomson Reuters' subject categories were aggregated into 15 disciplines. Only a very few publishers mainly from the UK and USA covered three quarters of these 15 disciplines, and 80.5% of the books and chapters remained uncited. In addition, two serious errors were found in this database: the Book Citation Index does not retrieve all citations for books and chapters and book citations do not include citations to their chapters.

The *International Consortium on Landslides* (ICL) as one of the leading international and non-governmental societies in the field of landslide research and landslide risk reduction was established in 2002 and is located in Kyoto, Japan. Since 2004, the ICL has been publishing the international Journal *Landslides: Journal of International Consortium on Landslides* (Sassa 2018). The journal *Landslides* was analyzed several times for its impact on the world landslide community, using selected scientometric (bibliometric) parameters (Sassa et al. 2009, 2015; Mikoš 2011, 2017)—the journal has been proved to be very successful, read by many stakeholders from the world landslide research society studying periodical literature.

An important contribution of the ICL to capacity building for landslide risk reduction in the world are triennial World Landslide Forums (WLF): WLF1 in Tokyo 2008, WLF2 in Rome in 2011, WLF3 in Beijing in 2014, WLF4 in Ljubljana in 2017, and forthcoming WLF5 in Kyoto in 2020—see http://wlf5.iplhq.org/ for details. In the last few years, a debate started among the ICL community whether to publish accepted and reviewed papers at the world landslide forums in the classical printed book form, or to move to electronic book format only, combining it with open access for all papers and occasional customers' tailored printing-on-demand. This paper has been originated from such discussions and was stimulated by questions about the impact of the ICL book chapters compared to journal *Landslides* papers and/or to other non-ICL book chapters and books in the field of landslide research. The main aim of the paper is to analyze between the ICL monographs and proceedings of the World Landslide Forums printed as books by Springer Nature, and selected landslide-related book titles, not published by the ICL, in order to measure relative impact and reputation of the ICL books. We will start with a short description of the most widely used citation databases.

Material and methods

The main databases used in the last two decades for journal bibliometric analyses are the Web of Science (WoS) by Clarivate Analytics (formerly Thomson Scientific, ISI—Institute for Scientific Information) and Elsevier's Scopus database. Questions arise, can they also be used for book bibliometric analyses? Are there new web tools available to perform a bibliometric analysis of books, specifically books related to landslide science?

Elsevier's Scopus database

Developing its own Scopus database, Elsevier offers different journal metrics, among others (Elsevier 2018):

- SJR—SCImago Journal Rank (SJR) takes into account both the number of citations received by a journal and the prestige of the journal based on where those citations come from.
- SNIP—Source Normalized Impact per Paper (SNIP) measures contextual citation impact by weighting citations based on the total number of citations in a subject field. It helps to compare a journal with competing journals in a subject area.
- New as of December 2016, the metric called CiteScore measures average citations received per document published in the serial—citations are taken into account that have been received in a given year for the documents published in the previous 3 years (note that a 2-year window is used for the ISI Impact Factor computation).

Clarivate Analytics' Web of Knowledge database (WoK)

Web of Knowledge (Clarivate Analytics, 2018a) offers several web tools for bibliometric research. One of them is Web of Science and its Core Collection that covers different citation indices with extended coverage of international literature:

- peer-reviewed journals in Science Citation Index Expanded (SCI_EXPANDED, since 1900), Social Sciences Citation Index (SSCI, since 1900), Arts & Humanities Citation Index (A&HCI, since 1975), and in Emerging Sources Citation Index (ESCI, since 2015);
- conference proceedings in Conference Proceedings Citation Index—Science (CPCI-S, since 2011) and in Conference Proceedings Citation Index—Social Sciences & Humanities (CPCI-SSH, since 2011) (Clarivate Analytics, 2018b);
- books in Book Citation Index—Science (BKCI-S, since 2011) and in Book Citation Index—Social Sciences and Humanities (BKCI-SSH, since 2011) (Clarivate Analytics, 2018c);

The coverage of WoS for books and conference proceedings since 2011 is not ideal, and for the purpose of this study, WoS only partially covers the ICL-related books published by Springer Nature publisher.

Springer Nature web tools, Bookmetrix, and eBook collections

The Directory of Open Access Books (DOAB) has been offered at the end of 2017 for over 10,000 academic peer-reviewed books and chapters from close to 250 publishers (DOAB 2018). Springer Nature is a sponsor of DOAB, and all SpringerOpen books (Springer 2018a) are freely available online at SpringerLink (Springer 2018b) and listed in the Directory of Open Access Books (DOAB 2018) since 2010. The Creative Commons Attribution 4.0 (CC BY) license is the default license for SpringerOpen books. Although ICL publishes its books with Springer Nature, only one book title has been published so far as an open access book (Sassa et al. 2017), all of which are electronically accessible per subscription using Springer Books platform (Springer 2018c).

This database offers data on selected book metrics using a web tool called Bookmetrix (2018). Bookmetrix was developed by Springer Nature in partnership with *Altmetric* (2018), and it brings together a collection of performance metrics to measure how books are being discussed, cited, and used around the world. It offers a comprehensive overview of the reach, usage, and

Table 1 Correlation between four selected SCOPUS metrics for the period 2011–2016 (Elsevier 2018)

Pearson coefficient	All serials (49,145)	Journals (46,774)	Trade journals (663)	Book series (1245)	Conference proceedings (463)
CiteScore—Percent Cited	0.682	0.692	0.851	0.665	0.787
CiteScore—SNIP	0.820	0.825	0.893	0.763	0.898
CiteScore—SJR	0.838	0.831	0.863	0.909	0.871

Table 2 Springer eBook Package Earth and Environmental Science (data retrieved in May, 2018; Springer, 2018a)

Year	Nr. of books	Monographs	Contributed volume	Proceedings	Others	Subject collection performance	Collection citation performance 5 and 2 years	Total downloads	Total citations
1918–89	912	29%	34%	25%	16%	63%	n. a.	0.27M	7.10K
1990–99	1099	22%	46%	13%	19%	63%	n. a.	0.27K	6.10K
2000–04	654	27%	43%	7%	23%	37%	n. a.	0.67M	4.45K
2005	150	45%	16%	15%	24%	59%	1.21 and 0.00	3.89M	6.77K
2006	167	49%	14%	19%	18%	59%	1.58 and 1.58	3.17M	6.29K
2007	164	51%	14%	19%	16%	45%	1.39 and 1.39	3.15M	6.09K
2008	209	56%	15%	13%	16%	48%	1.98 and 1.66	4.39M	7.48K
2009	206	51%	22%	12%	15%	68%	1.89 and 1.69	4.80M	7.15K
2010	223	56%	20%	7%	17%	46%	2.29 and 1.91	4.86M	6.75K
2011	225	55%	23%	9%	13%	72%	2.51 and 2.09	4.94M	7.36K
2012	221	52%	22%	8%	18%	31%	3.05 and 2.66	5.11M	4.70K
2013	343	55%	23%	3%	19%	51%	3.31 and 2.80	7.54M	6.01K
2014	412	49%	23%	4%	23%	45%	3.29 and 2.43	8.98M	5.45K
2015	391	55%	17%	4%	24%	33%	3.51 and 2.69	5.81M	3.45K
2016	421	55%	12%	3%	30%	23%	4.10 and 3.16	4.25M	2.70K
2017	409	56%	13%	4%	24%	3%	3.93 and 3.10	3.36M	1.37K
Average per year	6207	41%	28%	11%	20%	47%	n. a.	3.14M	5.44K

Year	Total reviews	Total mentions	Total readers	Downloads per book	Citations per book	Reviews per book	Mentions per book	Readers per book
1918–89	17	18	2.43K	0.29K	8	0.0	0.0	3
1990–99	24	11	1.93K	0.25K	6	0.0	0.0	2
2000–04	94	48	4.70K	0.93K	7	0.1	0.1	7
2005	127	155	23.2K	25.9K	45	0.8	1.0	155
2006	103	125	20.6K	19.0K	38	0.6	0.7	123
2007	133	103	21.6K	19.2K	37	0.8	0.6	132
2008	119	128	23.5K	21.0K	36	0.6	0.6	112
2009	107	254	24.5K	23.3K	35	0.5	1.2	119
2010	118	219	22.5K	21.8K	30	0.5	1.0	101
2011	63	457	23.7K	22.0K	33	0.3	2.0	105

Table 2 (continued)

Year	Total re-views	Total men-tions	Total read-ers	Downloads per book	Citations per book	Reviews per book	Mentions per book	Readers per book
2012	72	355	18.6K	23.1K	21	0.3	1.6	84
2013	84	1740	23.3K	22.0K	18	0.2	5.1	68
2014	99	741	27.3K	21.8K	13	0.2	1.8	66
2015	78	1470	23.1K	14.9K	9	0.2	3.8	59
2016	69	2320	16.4K	10.1K	6	0.2	5.5	39
2017	31	3180	11.2K	8.20K	3	0.1	7.8	27
Average per year	66	675	13.2K	10.5K	14.4	0.2	1.8	46

Subject Collection Performance—Percentage of books from Subject Collection EES that are cited more than the discipline average; n. a.—not available

readership of books or book chapters by providing various book-level and chapter-level metrics all in one place. Now its full capacity can be used only within the Springer community, but free data are available via book pages on SpringerLink (Springer 2018b). Everyone can use these free pages to retrieve metrics for Springer books and chapters (Springer 2018d). Apart from classic metrics such as the number of downloads (using SpringerLink as the data source) and the number of citations (using CrossRef as the data source), alternative metrics are introduced, such as Mentions (online mentions provided by Altmetric based on variety of online sources including blogs and social media among others) and Readers (using Mendeley as the data source).

In its latest version, Bookmetrix is extending its scope by providing better insights into the reach and impact of Springer Nature's various eBook collections. With these new, innovative features, Bookmetrix is adding value by offering detailed information for authors and readers as well as librarians. Especially interesting is a new book metric called Collection Citation Performance (CCP). The CCP for a selected year is calculated as the number of citations in this year of books published in two previous years (respectively 5 years for a 5-year indicator), divided by the total number of books published in this eBook collection in the same time period—similar to the well-established journal metrics, such as Impact Factor, as an example.

Therefore, for the bibliometric analysis of the impact of the ICL books within the Springer environment, Springer-developed web tools and their selected subscription databases were used. As the ICL books are related to earth sciences, they are offered electronically as a part of the Springer eBook package *Earth and Environmental Science* (EES); hence, this specific book collection was used.

Google Scholar

Much larger than the abovementioned databases is the web database used by the Google Scholar (GS) search engine (Google 2018). In last years, Google Scholar with its wide coverage is starting to be used widely, especially as it is free of charge (free software Publish or Perish—www.harzing.com/pop.htm was used) and while it yields higher bibliometric values due to its wide coverage of literature and documents. The application retrieves citations for books and/or book chapters using titles, ISBN resp. ISSN number, or authors' names. Using these citation data, the application computes different metrics, such as h-index and g-index. Given a set of published articles, ranked in decreasing order of the number of citations that they received, the g-index is the (unique) largest number such that the top g articles received (together) at least g^2 citations (Egghe 2006).

Results and discussion

In our analysis, we will present results starting from a wider perspective and then going into a more detailed presentation, focusing on the landslide-related books published by the ICL since 2005.

As a proxy to estimate coverage of landslide science by a database, we used the word "landslide" as the search term in titles covered by Web of Science and SCOPUS. The latter generally gives a better coverage of the topic.

Table 3 Springer eBook Package Earth and Environmental Science—landslide science-related top books in the period 2005–2018 and their rank no. (data retrieved in May 2018; Springer 2018a)

Year	No. of books	Rank in Bookmetrix downloads	Rank in Bookmetrix citations
2005	150	–	No. 2—Jakob and Hungr (2005): Debris-Flow Hazards and Related Phenomena (489 citations)
2006	167	No. 3—Evans et al. (2006): Landslides from Massive Rock Slope Failure (105K)	–
2007	164	No. 9—Sassa et al. (2007): Progress in landslide Science (50.2K)	–
2008	209	–	–
2009	206	No. 4—Sassa et al. (2009): Landslides—Disaster Risk Reduction (116K)	–
2010	223	–	–
2011	225	–	–
2012	221	–	–
2013	343	No. 1—Margottini et al. (2013b): Landslide Science and Practice—Vol. 2 (257K) No. 3—Margottini et al. (2013a): Landslide Science and Practice—Vol. 1 (186K)	–
2014	412	–	No. 1—Sassa et al. (2014b): Landslide Science for a Safer Geoenvironment—Vol. 2 (131 citations)
2015	391	–	No. 1—Lollino et al. (2015b): Engineering Geology for Society and Territory—Vol. 2 (196 citations)
2016	421	–	–
2017	409	No. 1—Sassa et al. (2017): Advancing Culture of Living with Landslides—Vol. 1 (196K)	No. 3—Mikoš et al. (2017a): Advancing Culture of Living with Landslides—Vol. 2 (60 citations)
2018	445	–	–

WoS and SCOPUS coverage of landslide research

As of May 6, 2018, in Web of Science Core Collection, 8.080 titles were found that have the word “landslide*” in its title. Out of these 8.080 titles, there were 6.151 articles, 1.582 proceedings papers, 194 editorial material, 95 review papers, 85 book chapters, 66 book reviews, … More than three quarters of all item in WoS are journal articles. Out of 8.080 titles, 1.455 were open access items.

Among 8.080 titles, 67 papers were recognized as Highly Cited in Field (top 1% with regard to citation), out of them 63 articles and 4 review papers—one proceedings paper among them, but published in a journal.

The three most productive organizations with regard to the total number of publications among the 8.080 titles were CNR (Italy) with 361 publications (4.5%), followed by the Chinese Academy of Sciences (330 publications, 4.1%), and Chinese University of Geosciences, Wuhan (242 publications, 3.0%).

The top cited papers received the following number of citations: 937, 799, 698, 622, 563, and so on—their h-index was 137, and 72% of them were cited at least once.

As of May 6, 2018, in SCOPUS database, 14.144 titles were found that have the word “landslide*” in its title. Out of these 14.144 titles, there were 9.436 articles, 3.255 conference papers, 753 book chapters, 216 reviews, 150 articles in press, … or with regard to the source type, there were 9.774 papers from journals, 2.683 conference proceedings, 1.052 books, 565 book series, …. The share of the journals in SCOPUS database is roughly 70%, followed by roughly 20% conference proceedings, and finally roughly 10% book titles. Highly cited papers cannot be determined in SCOPUS.

The three most productive organizations with regard to the total number of publications among the 14.144 titles were the Chinese Academy of Sciences (602 publications, 4.3%), followed by CNR (Italy) with 479 publications (3.4%), and Chinese University of Geosciences, Wuhan (465 publications, 3.3%).

The top cited papers received the following number of citations: 1565, 1130, 1000, 791, 733, and so on—their h-index was 179. The percentage of cited items cannot be determined, since SCOPUS allows only the first 2000 items to be displayed.

Scopus metrics

Only Scopus data for 2016 (given in Table 1) was used, and the CiteScore metrics were calculated using data available from May 31, 2017. In the CiteScore database, there were 49,145 serials: 46,774 journals, 663 trade journals, 1245 book series, and 463 conference proceedings. The aim of the analysis was to find a correlation between metrics for different types of serials using Scopus data. For this purpose, Pearson correlation coefficient of linear correlation was determined for different pairs of metrics.

The overall Pearson coefficient for all 49,145 serials is quite high ($p = 0.682$) and shows good linear correlation between the CiteScore of a serial and the Percent Cited (the proportion of the documents in the serials published in 2013–2015 that have received at least 1 citations in 2016). The Pearson correlation between

Table 4 Selected 52 book titles from the Springer eBook collection Earth and Environmental Science (EES)

No.	Authors	Book title	ICL/IPL activity	Publication year	Discipline	Type
1	Sassa et al. 2005	Landslides—Risk Analysis and Sustainable Disaster Management	WLF0	2005	GEOG	M
2	Sassa and Canuti 2009	Landslides—Disaster Risk Reduction	WLF1	2009	ES	M
3	Margottini et al. 2013a	Landslide Science and Practice—Vol. 1	WLF2	2013	ES	M
4	Margottini et al. 2013b	Landslide Science and Practice—Vol. 2	WLF2	2013	ES	M
5	Margottini et al. 2013c	Landslide Science and Practice—Vol. 3	WLF2	2013	ES	M
6	Margottini et al. 2013d	Landslide Science and Practice—Vol. 4	WLF2	2013	ES	M
7	Margottini et al. 2013e	Landslide Science and Practice—Vol. 5	WLF2	2013	ES	M
8	Margottini et al. 2013f	Landslide Science and Practice—Vol. 6	WLF2	2013	ES	M
9	Margottini et al. 2013g	Landslide Science and Practice—Vol. 7	WLF2	2013	ES	M
10	Sassa et al. 2014a	Landslide Science for a Safer Geoenvironment—Vol. 1	WLF3	2014	ENV	P
11	Sassa et al. 2014b	Landslide Science for a Safer Geoenvironment—Vol. 2	WLF3	2014	ENV	P
12	Sassa et al. 2014c	Landslide Science for a Safer Geoenvironment—Vol. 3	WLF3	2014	ENV	P
13	Sassa et al. 2017	Advancing Culture of Living with Landslides—Vol. 1	WLF4	2017	ES	P
14	Mikoš et al. 2017a	Advancing Culture of Living with Landslides—Vol. 2	WLF4	2017	ES	P
15	Mikoš et al. 2017b	Advancing Culture of Living with Landslides—Vol. 3	WLF4	2017	ES	P
16	Mikoš et al. 2017c	Advancing Culture of Living with Landslides—Vol. 4	WLF4	2017	ES	P
17	Mikoš et al. 2017d	Advancing Culture of Living with Landslides—Vol. 5	WLF4	2017	ES	P
18	Sassa et al. 2007	Progress in Landslide Science	IPL	2007	GEOG	M
19	Sassa et al. 2013	Landslides: Global Risk Preparedness	IPL	2013	ES	M
20	Shan et al. 2014	Landslides in Cold Regions in the Context of Climate Change	IPL	2014	ES	M
21	Sassa et al. 2018a	Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools, Vol. 1	IPL	2018	ES	M
22	Sassa et al. 2018b	Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools, Vol. 2	IPL	2018	ES	M
23	Lollino et al. 2015a	Engineering Geology for Society and Territory—Vol. 1	IAEG	2015	ES	P
24	Lollino et al. 2015b	Engineering Geology for Society and Territory—Vol. 2	IAEG	2015	ES	P
25	Lollino et al. 2015c	Engineering Geology for Society and Territory—Vol. 3	IAEG	2015	ES	P
26	Lollino et al. 2015d	Engineering Geology for Society and Territory—Vol. 4	IAEG	2015	ES	P
27	Lollino et al. 2015e	Engineering Geology for Society and Territory—Vol. 5	IAEG	2015	ES	P
28	Lollino et al. 2015f	Engineering Geology for Society and Territory—Vol. 6	IAEG	2015	ES	P
29	Lollino et al. 2015g	Engineering Geology for Society and Territory—Vol. 7	IAEG	2015	ES	P
30	Lollino et al. 2015h	Engineering Geology for Society and Territory—Vol. 8	IAEG	2015	ES	P

Table 4 (continued)

No.	Authors	Book title	ICL/IPL activity	Publication year	Discipline	Type
31	Locat and Mienert 2003	Submarine Mass Movements and Their Consequences—1st Int. Symp.	No	2003	ES	P
32	Lykousis et al. 2007	Submarine Mass Movements and Their Consequences—3rd Int. Symp.	No	2007	ES	P
33	Mosher et al. 2010	Submarine Mass Movements and Their Consequences—4th Int. Symp.	No	2010	ES	P
34	Yamada et al. 2012	Submarine Mass Movements and Their Consequences—5th Int. Symp.	No	2012	ES	P
35	Krastel et al. 2014	Submarine Mass Movements and Their Consequences—6th Int. Symp.	No	2014	ES	P
36	Lamarche et al. 2016	Submarine Mass Movements and Their Consequences—7th Int. Symp.	No	2016	ES	P
37	Erismann and Abele 2001	Dynamics of Rockslides and Rockfalls	No	2001	ES	M
38	Jakob and Hungr 2005	Debris-flow Hazards and Related Phenomena	No	2005	ES	M
39	Evans et al. 2006	Landslides from Massive Rock Slope Failure	No	2006	ES	P
40	L'Heureux et al. 2014	Landslides in Sensitive Clays: From Geosciences to Risk Management	No	2014	ES	M
41	Thakur et al. 2017	Landslides in Sensitive Clays: From Research to Implementation	No	2017	ES	M
42	Thiebes 2012	Landslide Analysis and Early Warning Systems	No	2012	ES	PhD
43	Pradhan and Buchroithner 2012	Terrigenous Mass Movements	No	2012	ES	M
44	Ugai et al. 2013	Earthquake-Induced Landslides	No	2013	ES	P
45	Ren 2015	Storm-triggered Landslides in Warmer Climates	No	2015	ES	M
46	Scaioni 2015	Modern Technologies for Landslide Monitoring and Prediction	No	2015	ES	M
47	Mandal and Maiti 2015	Semi-quantitative Approaches for Landslide Assessment and Prediction	No	2015	ES	M
48	Klose 2015	Landslide Databases as Tools for Integrated Assessment of Landslide Risk	No	2015	ES	PhD
49	Wu 2015	Recent Advances in Modeling Landslides and Debris Flows	No	2015	ENG	M
50	Pradhan 2017	Laser Scanning Applications in Landslide Assessment	No	2017	ES	M
51	Zhao 2017	Coupled DEM-CFD Analyses of Landslide-Induced Debris Flows	No	2017	ENG	M
52	Yamagishi and Bhandari 2017	GIS Landslide	No	2017	ES	M

Discipline: *ES* Earth Sciences, *ENV* Environment, *GEOG* Geography; Type: *M* Monograph, *P* Proceedings, *PhD* Doctoral Thesis

CiteScore and SNIP ($p = 0.820$) and CiteScore and SJR ($p = 0.838$) are even higher. This shows a good potential of CiteScore as a new metric for serials. Conference proceedings (463 titles) are exhibiting higher linear correlation between CiteScore and each of the other three metrics when compared to journals (46,774 titles, leaving out trade journals with only 663 titles). In addition,

Table 5 Bookmetrics data for the selected 52 eBooks from the Springer package Earth and Environmental Science (EES) (data retrieved in May, 2018; Springer 2018a)

Selected eBooks No.	Authors	Bookmetrix Chapters	Downloads	Citations	Citations per item	Book citations	Journal citations	h-index	% cited chapters	Mentions	Readers
1	Sassa et al. 2005	46	87.9K	51	1.11	8	43	3	46	0	132
2	Sassa and Canuti 2009	33	116K	119	3.61	23	96	5	79	5	154
3	Margottini et al. 2013a	79	186K	101	1.28	17	84	5	43	0	67
4	Margottini et al. 2013b	89	257K	49	0.55	10	39	3	30	0	446
5	Margottini et al. 2013c	60	109K	48	0.80	12	36	3	47	1	19
6	Margottini et al. 2013d	55	78.1K	38	0.69	10	28	3	40	0	47
7	Margottini et al. 2013e	45	60.7K	28	0.62	3	25	3	33	2	14
8	Margottini et al. 2013f	101	23.1K	65	0.64	10	55	3	35	1	42
9	Margottini et al. 2013g	44	50.4K	34	0.77	8	26	3	30	3	11
10	Sassa et al. 2014a	67	78.9K	67	1.00	25	42	4	46	1	289
11	Sassa et al. 2014b	129	61.4K	131	1.02	47	84	4	46	0	254
12	Sassa et al. 2014c	106	37.9K	45	0.42	10	35	2	32	1	169
13	Sassa et al. 2017	51	196K	5	0.10	0	5	1	8	1	23
14	Mikoš et al. 2017a	133	80.4K	61	0.46	53	8	2	40	5	61
15	Mikoš et al. 2017b	70	45.2K	25	0.36	12	13	2	29	1	17
16	Mikoš et al. 2017c	79	37.0K	8	0.10	0	8	1	10	3	29
17	Mikoš et al. 2017d	63	22.1K	12	0.19	2	10	1	16	15	217
18	Sassa et al. 2007	26	54.2K	64	2.46	6	58	3	62	0	301
19	Sassa et al. 2013	26	43.3K	18	0.69	9	9	3	31	1	97
20	Shan et al. 2014	21	14.0K	25	1.19	4	21	2	38	0	36
21	Sassa et al. 2018a	42	14.5K	0	0.00	0	0	0	0%	2	85
22	Sassa et al. 2018b	54	7.62K	0	0.00	0	0	0	0%	0	3
23	Lollino et al. 2015a	105	29.3K	32	0.30	2	30	2	22	15	316
24	Lollino et al. 2015b	388	36.5K	196	0.51	33	166	4	28	9	1060
25	Lollino et al. 2015c	129	71.4K	44	0.34	5	39	3	22	2	449

Table 5 (continued)

Selected eBooks No.	Authors	Bookmetrix Chapters	Downloads	Citations	Citations per item	Book citations	Journal citations	h-index	% cited chapters	Mentions	Readers
26	Lollino et al. 2015d	43	27.5K	13	0.30	1	12	2	21	5	254
27	Lollino et al. 2015e	265	18.2K	62	0.23	6	56	3	17	20	576
28	Lollino et al. 2015f	195	83.7K	18	0.09	0	18	1	9	4	389
29	Lollino et al. 2015g	54	26.6K	5	0.09	3	2	1	7	3	100
30	Lollino et al. 2015h	103	36.1K	22	0.21	3	19	2	17	6	286
31	Locat and Mienert 2003	58	14.7K	185	3.19	16	169	7	71	0	382
32	Lykousis et al. 2007	43	45.6K	99	2.30	13	86	5	74	0	161
33	Mosher et al. 2010	62	76.5K	65	1.05	6	59	3	56	0	1170
34	Yamada et al. 2012	66	109K	130	1.97	26	104	6	73	7	665
35	Krastel et al. 2014	61	74.6K	94	1.54	15	79	3	61	3	184
36	Lamarche et al. 2016	61	63.3K	36	0.59	8	28	3	38	15	338
37	Erismann and Abele 2001	7	1.09K	73	10.43	5	68	0	0	0	38
38	Jakob and Hungr 2005	27	77.2K	489	18.11	51	438	12	93	3	760
39	Evans et al. 2006	32	105K	138	4.31	12	126	6	88	2	164
40	L'Heureux et al. 2014	31	40.1K	57	1.84	40	17	4	77	0	112
41	Thakur et al. 2017	50	17.3K	24	0.48	20	4	2	28	10	23
42	Thiebes 2012	11	11.0K	11	1.00	1	10	1	9	0	59
43	Pradhan and Buchroithner 2012	12	11.5K	52	4.33	4	48	3	75	0	207
44	Ugai et al. 2013	107	61.6K	49	0.46	5	44	3	28	2	69
45	Ren 2015	11	8.45K	0	0.00	0	0	0	0	0	18
46	Scaioni 2015	12	14.7K	11	0.92	3	8	2	50	3	19
47	Mandal and Maiti 2015	8	5.56K	7	0.88	0	7	1	25	0	30
48	Klose 2015	6	2.65K	3	0.50	3	0	1	17	0	40
49	Wu 2015	25	35.5K	10	0.40	0	10	1	32	1	129

Table 5 (continued)

No.	Selected eBooks Authors	Bookmetrix Chapters	Downloads	Citations	Citations per item	Book citations	Journal citations	h-index	% cited chapters	Mentions	Readers
50	Pradhan 2017	16	5.24K	12	0.75	2	10	2	56	0	41
51	Zhao 2017	6	1.90K	1	0.17	0	1	1	17	0	15
52	Yamagishi and Bhandari 2017	13	5.05K	0	0.00	0	0	0	0	2	33
	Average	65.9	53.4K	56.4	–	10.6	45.8	3	32	3	204
	Sum	3426	2.78M	2932	–	552	2383	–	–	154	10.6K

book series with 1245 titles exhibit comparable Pearson coefficients to those for journals. These results show that the proposed Scopus journal metrics may be used for different types of serials, also for book series and conference proceedings. It is therefore important for a book to be included into the Scopus database.

Springer Nature eBook package Earth and Environmental Science (EES)

Springer's Earth and Environmental Science eBook Package brings together up-to-date resources from trusted authors working around the world on topics such as water management, ecology, geology, environmental biotechnology, and sustainable development. The data for the period from 2005 to 2017 is shown in Table 2.

In Table 2, a steady growth of book titles covered by the collection can be observed in the period from 2004 onward. The prevailing type of periodicals covered in the EES collection by the number of titles are monographs (41%), followed by contributed volumes (28%), and other types (20%)—the proceedings are making 11% out of all 6207 book titles. Looking at the Subject Collection Performance (i.e., percentage of books from Subject Collection EES that are cited more than the discipline average—i.e., 50%), the performance is very good. The EES Collection Citation Performance (CCP) for 2 years grew over years steadily to over 3 in 2017, and for the 5 years, it is close to 4. The values of CCP are comparable to the journals' Impact Factor.

From Altmetric point of view, the number of Reviews and Mentions per package and year are rather small, and the impact of eBooks in this respect is limited as measured by Bookmetrix. The number of chapter downloads per package and year has roughly doubled from 4 to 8 million per year since mid-2000s, mainly due to the growth in number of titles per package, as shown by a stable average downloads per book in a year. Average number of citations per book in this period is ~ 14, but close to half of the book titles are not monographs (having individual chapters); this citation rate is not very high compared to journals.

Searching for the top ranked book titles in the EES Package for the period 2005–2017 with respect to the number of downloads per book and the number of citations per book, some landslide research and landslide risk reduction-related book titles can be found, some of which are produced by the ICL (Table 3). This confirms the importance of landslide science within the earth and environmental sciences as covered by Springer books.

Furthermore, looking at the highlights in Earth Sciences in 2017, prepared by Springer Nature (Springer 2018e), among 10 most downloaded journal articles, there is no article from the ICL journal *Landslides*, and among top downloaded new books in Earth Sciences, the title *Landslides in Sensitive Clays* (Thakur et al. 2017) is mentioned.

Selected landslide-related book titles from Springer EES package

For the analysis, we have selected 52 book titles from the Springer eBook package Earth and Environmental Science (EES), related to landslide science (Table 4). The distribution of 52 selected book titles to disciplines within the package is as follows: Earth Sciences (45 titles), Environment (3 titles), Geography (2 titles), and Engineering (2 titles). A similar distribution to the serial type is as follows: monographs (26 titles), proceedings (24), and PhD theses (2 titles). Overall, 22 book titles are related to the ICL activities, and the rest are not. The 52 selected books have together 3426

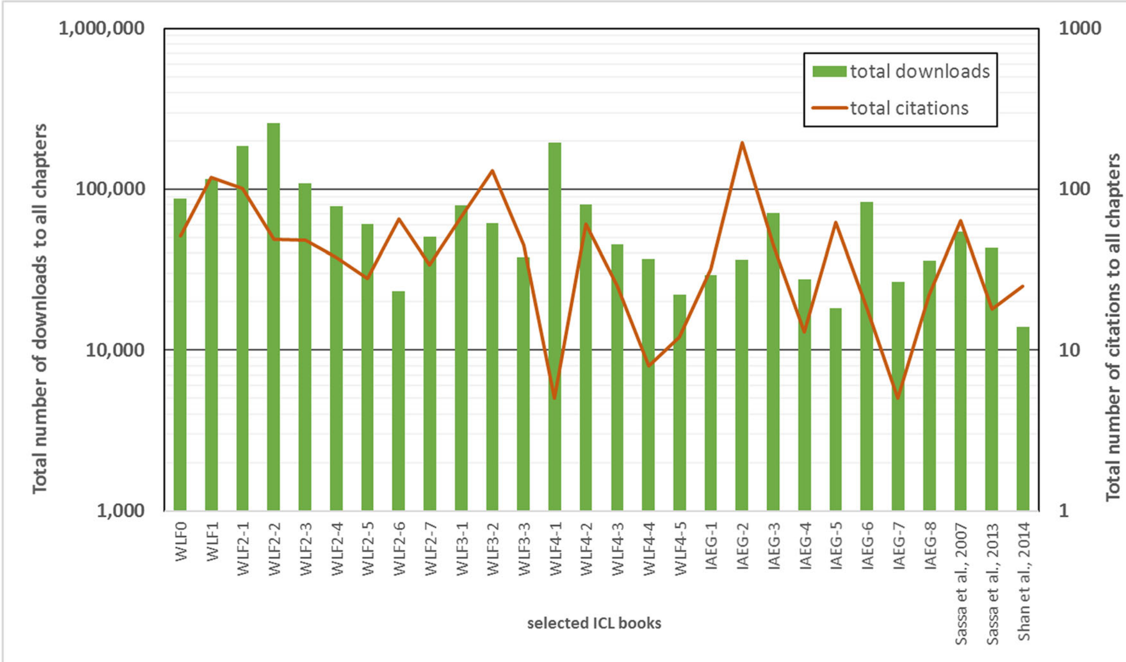

Fig. 1 Bookmetrics chapter downloads and citations for the selected 28 book titles (data retrieved in May, 2018; Springer 2018a)

chapters, or nearly 66 chapters per book on average. The total number of downloads of all 52 books is over 2.778 million or 53,415 on average per title. The total number of citations is 2932, and the average number of citations per book title is 56.4, and per book chapter is 2.67, since only 1098 out of 3426 chapters have been cited so far—i.e., 32% chapters from the analyzed 52 books. Out of 56.4 received citations on average per 52 analyzed books, on average, 10.6 are from books and 45.8 are from journals—an important conclusion that books are not cited only in other books. The average h-index of books is (only) 3—i.e., only 3 chapters, on average, received 3 or more citations (the average number of chapters per book is nearly 66). Comparing the selected landslide-related 52 books (Table 5) with the whole eBook package EES (Table 2), the books in landslide science and landslide risk reduction are above average with respect to the average number of *Downloads* and *Citations* per book, as well as the number of *Mentions* and *Readers*.

Comparing the ICL-related books with the rest of the analyzed books, we have taken the following two titles as the benchmark: *Debris-flow Hazards and Related Phenomena* by Jakob and Hungr (2005) with 93% cited chapters and h-index = 12 and *Landslides from Massive Rock Slope Failure* by Evans et al. (2006) with 88% cited chapters and h-index = 6. The ICL-related titles *Landslides—Disaster Risk Reduction* by Sassa and Canuti (2009) with 79% cited chapters and h-index = 5 and *Landslides—Risk Analysis and Sustainable Disaster Management* by Sassa et al. (2005) with 46% cited chapters and h-index = 3 is not on pair with these two highly cited books. Comparing the impact of, e.g., WLF2 in Rome (Margottini et al. 2013a-2013g) and WLF3 in Beijing (Sassa et al. 2014a-2014c) with the XII IAEG Congress in Turin (Lollino

Table 6 Comparison of the 52 landslide-related books and the whole Springer eBook Package Earth and Environmental Science (EES) (data retrieved in May, 2018; Springer 2018a)

Book selection	No. of books	Total downloads	Total citations	Total readers	Total downloads per book	Total citations per book	Total readers per book
ICL-related books	22	1.660.720	994	2.513	75.487	45.2	114
Non-ICL-related books	30	1.116.840	1.938	8.087	37.228	64.6	270
Landslide-related books 2001–2017	52	2.777.560	2.932	10.600	53.415	56.4	204
EES 2000–2017	4196	64.857.000	76.020	284.200	15.457	18.1	68
EES 1918–2017	6207	65.392.000	89.220	288.560	10.535	14.4	46

Table 7 Correlation between the selected metrics for the 52 landslide-related books from the Springer eBook Package Earth and Environmental Science (EES) (data retrieved in May, 2018; Springer 2018a)

Pearson coefficient *r*	Publication year	Number of chapters	Total downloads	Total citations	Citations per chapter	Total Readers	Book h-index	% cited chapters
Publication year		0.19	−0.13	*−0.57*	*−0.67*	−0.23	*−0.57*	*−0.53*
Number of chapters			0.13	0.20	−0.21	*0.55*	0.10	−0.14
Total downloads				0.22	0.04	0.19	0.35	0.26
Total citations					*0.80*	*0.54*	*0.89*	*0.62*
Citations per chapter						0.25	*0.63*	0.46
Total readers							0.47	0.29
Book h-index								*0.81*
% cited chapters								

The Pearson cofficient values in italics represent strong and moderate positive and negative linear correlations, respectively

et al. 2015a-2015h) shows that the variability in the total number of citations among volumes of the same scientific event are larger than between the events (WLF2, WLF3, and XII IAEG). This confirms that it is not easy for scientific committees and volume editors to prepare a set of equally "important" volumes for a single scientific event that will be approximately equally cited in the future, since some topics are "hot," attract more researchers, and are later more cited than other topics from the same scientific event.

The differences in the number of chapter downloads and the number of cited chapters are also shown graphically in Fig. 1 for selected 28 book titles from the Springer eBook Package EES. For the whole package, the average number of downloads per book is 10.5 K, and the average number of citations per book is 14.4—both metrics are taken from Table 2. Overall, the ICL-related books, analyzed in this paper, are among well-cited book titles in the field of earth sciences.

Furthermore, we have compared the selected 52 landslide-related book titles (ICL- and non-ICL-related titles) and the whole Springer eBook package EES (Table 6). The selected 52 landslide-related book titles are above the average metrics for the whole EES with regard to the total number of downloads per book, the total number of citations per book, and the total number of readers per book. The ICL-related books are getting more downloads but less readers and citations (so far) as the selected non-ICL-related books.

We also looked at the linear correlation using Pearson coefficient p between selected metrics for the 52 landslide-related books—strong positive linear correlation ($0.8 < p < 1$), moderate positive linear correlation ($0.5 < p < 0.8$), and moderate negative linear correlation ($-0.8 < p < -0.5$) are given in italics in Table 7.

To expand the comparison and to strengthen the bibliometric analysis, further book metrics, made available by other widely used databases, were used.

Book metrics in Web of Science, Google Scholar, and SCOPUS

We searched for the data on book metrics for the selected 52 book titles from Table 4 in the following three databases: Web of Science (WoS by Clarivate Analytics), Google Scholar (by Google Inc.), and in SCOPUS (by Elsevier). Not all book titles are covered by all three databases. The obtained results are shown in Table 8. Only 16 book titles are covered by WoS, among them only *Landslides in Cold Regions in the Context of Climate Change* by Shan et al. (2014) is an ICL-related title. All 52 book titles are covered by Google Scholar, only that separate volumes (book titles) from the same event cannot be easily distinguished, and therefore, GS data are presented in this case for all volumes only. The SCOPUS database has not covered 11 book titles; for 5 further book titles, no data was available on the chapter level (% cited chapters, chapter h-index).

Google Scholar (GS) achieves the highest metric values due to its wide coverage of literature. The average number of citations per book chapter is as follows: 79 in WoS, 207 in GS, and 139 in Scopus (for computation in GS, the total number of citations for a few books integrating all volumes (book titles) was divided by the number of volumes, i.e., WLF2, WLF3, WLF4, ISDR-ICL Interactive Teaching Tools, XII IAEG). The average (maximum) h-index is as follows: 3 (10) in WoS, 6 (19) in GS, and 5 (17) in Scopus. A direct title-to-title comparison shows higher h-index values for GS for all book titles compared to Scopus. The annual growth of h-index is rarely over 1 (h-I,norm in Table 8). The GS data also show that typically the average number of authors per book chapter is close to 3 (between 2 and 4).

Jakob and Hungr (2005) gets h-index = 19 (Bookmetrix: h-index = 12), and Evans et al. (2006) gets h-index = 16 (Bookmetrix: h-index = 6). The GS compound h-index for the ICL-related books is also higher as for the Bookmetrix data: Margottini et al. (2013a-2013g) from WLF2 in Rome 2011 gets h-index = 13 with ~60% cited chapters, comparable to Lollino et al. (2015a-2015h) from XII IAEG in Turin 2014 that gets h-index = 10 with a bit over 40% cited

Table 8 Web of Science, Google Scholar and Scopus data for the selected 52 eBooks from the Springer package Earth and Environmental Science (EES) (data retrieved in December 2017)

Selected eBooks		Web of Science			Google		
No.	Authors	Citations	h-index	Average citations per chapter	Authors per cited chapter	Citations	h-index
1	Sassa et al. 2005	n.a.	n.a.	n.a.	3.93	134	7
2	Sassa and Canuti 2009	n.a.	n.a.	n.a.	2.48	420	11
3	Margottini et al. 2013a	n.a.	n.a.	n.a.	3.41	1422	13
4	Margottini et al. 2013b	n.a.	n.a.	n.a.			
5	Margottini et al. 2013c	n.a.	n.a.	n.a.			
6	Margottini et al. 2013d	n.a.	n.a.	n.a.			
7	Margottini et al. 2013e	n.a.	n.a.	n.a.			
8	Margottini et al. 2013f	n.a.	n.a.	n.a.			
9	Margottini et al. 2013g	n.a.	n.a.	n.a.			
10	Sassa et al. 2014a	n.a.	n.a.	n.a.	3.39	597	9
11	Sassa et al. 2014b	n.a.	n.a.	n.a.			
12	Sassa et al. 2014c	n.a.	n.a.	n.a.			
13	Sassa et al. 2017	n.a.	n.a.	n.a.	3.55	226	3
14	Mikoš et al. 2017a	n.a.	n.a.	n.a.			
15	Mikoš et al. 2017b	n.a.	n.a.	n.a.			
16	Mikoš et al. 2017c	n.a.	n.a.	n.a.			
17	Mikoš et al. 2017d	n.a.	n.a.	n.a.			
18	Sassa et al. 2007	n.a.	n.a.	n.a.	2.50	175	6
19	Sassa et al. 2013	n.a.	n.a.	n.a.	2.85	80	4
20	Shan et al. 2014	37	4	1.54	3.67	63	4
21	Sassa et al. 2018a	n.a.	n.a.	n.a.	3.20	18	2
22	Sassa et al. 2018b	n.a.	n.a.	n.a.			
23	Lollino et al. 2015a	65	4	0.63	3.48	1524	10
24	Lollino et al. 2015b	206	4	0.53			
25	Lollino et al. 2015c	106	4	0.82			
26	Lollino et al. 2015d	11	1	0.26			
27	Lollino et al. 2015e	101	3	0.38			
28	Lollino et al. 2015f	27	1	0.14			
29	Lollino et al. 2015g	15	2	0.30			
30	Lollino et al. 2015h	46	3	0.45			
31	Locat and Mienert 2003	n.a.	n.a.	n.a.	2.00	55	1
32	Lykousis et al. 2007	n.a.	n.a.	n.a.	2.50	7	1
33	Mosher et al. 2010	n.a.	n.a.	n.a.	3.39	711	14
34	Yamada et al. 2012	335	10	5.08	3.52	592	14
35	Krastel et al. 2014	158	6	2.63	4.03	311	9
36	Lamarche et al. 2016	85	4	1.39	3.59	157	6

Table 8 (continued)

Selected eBooks No.	Authors	Web of Science Citations	h-index	Average citations per chapter	Google Authors per cited chapter	Citations	h-index
37	Erismann and Abele 2001	n.a.	n.a.	n.a.	2.00	0	0
38	Jakob and Hungr 2005	n.a.	n.a.	n.a.	1.74	1790	19
39	Evans et al. 2006	n.a.	n.a.	n.a.	1.97	809	16
40	L'Heureux et al. 2014	25	2	0.76	3.43	162	6
41	Thakur et al. 2017	n.a.	n.a.	n.a.	3.71	41	3
42	Thiebes 2012	n.a.	n.a.	n.a.	1.00	3	1
43	Pradhan and Buchroithner 2012	n.a.	n.a.	n.a.	3.80	148	4
44	Ugai et al. 2013	n.a.	n.a.	n.a.	3.55	212	7
45	Ren 2015	n.a.	n.a.	n.a.	1.00	4	1
46	Scaioni 2015	17	2	1.42	4.09	54	5
47	Mandal and Maiti 2015	n.a.	n.a.	n.a.	2.00	9	1
48	Klose 2015	3	1	0.50	1.00	0	0
49	Wu 2015	26	3	1.04	3.04	43	3
50	Pradhan 2017	n.a.	n.a.	n.a.	2.29	7	2
51	Zhao 2017	n.a.	n.a.	n.a.	1.00	0	0
52	Yamagishi and Bhandari 2017	n.a.	n.a.	n.a.	2.23	0	0

Selected eBooks No.	Google h-I,norm	h-I,annual	g-index	Scopus Citations	% cited chapters	Chapter h-index
1	3	0.23	10	n.a.	n.a.	n.a.
2	8	0.89	19	282	94%	10
3	6	1.20	18	179	61%	7
4				142	58%	6
5				81	60%	4
6				69	60%	4
7				45	51%	3
8				159	63%	5
9				53	48%	3
10	4	1.00	12	72	49%	4
11				207	61%	6
12				87	45%	4
13	1	1.00	3	n.a.	n.a.	n.a.
14				n.a.	n.a.	n.a.
15				n.a.	n.a.	n.a.
16				n.a.	n.a.	n.a.
17				3	5%	1
18	4	0.36	12	138	85%	5
19	2	0.40	8	44	73%	4
20	3	0.75	7	n.a.	n.a.	n.a.
21	1	0.50	4	n.a.	n.a.	n.a.

Table 8 (continued)

Selected eBooks No.	Google h-I,norm	h-I,annual	g-index	Scopus Citations	% cited chapters	Chapter h-index
22				n.a.	n.a.	n.a.
23	5	1.67	12	123	46%	5
24				337	43%	6
25				172	49%	6
26				29	42%	3
27				221	42%	5
28				76	28%	3
29				26	35%	2
30				81	44%	4
31	1	0.17	1	n.a.	n.a.	n.a.
32	1	0.09	2	246	89%	10
33	7	0.88	22	492	95%	11
34	6	0.86	19	477	91%	13
35	3	0.60	13	142	74%	6
36	2	0.67	7	123	73%	5
37	0	0	0	195	n.a.	n.a.
38	16	1.14	39	1254	96%	17
39	14	1.17	28	n.a.	n.a.	n.a.
40	4	0.80	10	15	29%	1
41	1	1.00	3	3	4%	1
42	1	0.17	1	26	n.a.	n.a.
43	3	0.50	10	56	58%	3
44	4	0.80	10	n.a.	n.a.	n.a.
45	1	0.33	2	1	n.a.	n.a.
46	2	0.67	6	15	50%	2
47	1	0.33	2	3	n.a.	n.a.
48	0	0	0	5	n.a.	n.a.
49	2	0.67	4	0	0%	0
50	1	1.00	2	3	13%	1
51	0	0	0	0	0%	0
52	0	0	0	0	0%	0

n.a. data not available

chapters. From the analyzed book titles, some older proceedings of the international symposium on *Submarine Mass Movements and Their Consequences* are also highly cited—exhibiting h-index of 14 (Mosher et al. 2010; Yamada et al. 2012) with over 90% of cited chapters. The average was 50% cited chapters for all book titles in Scopus.

The relation of citations to book chapters between Springer Bookmetrix data, GS, and Scopus is also shown on the sample of selected chapters from 20 ICL-related eBooks from the Springer package EES with the highest Bookmetrix citations or Google Scholar citations or both (Table 9). The number of chapter citations in Scopus is, in average, lower than in Google Scholar and higher than in Bookmetrix database of Springer. If we measure impact of a scientific book using chapter citations, we must be careful which database we use.

The number of Bookmetrix downloads is more or less the same for all chapters in the same volume (book title), reaching from 2000 to 3000 downloads per chapter in older book titles.

The Bookmetrix chapter citations are concentrated to only a few best chapters in a book title; the best ones from each analyzed book title has achieved until early 2018 between close to 10 and not more than 20 Bookmetrix citations. The majority of those citations came from journals and not from books.

Table 9 Selected chapters from 20 ICL-related eBooks from the Springer collection Earth and Environmental Science (EES) with the highest number of Bookmetrix citations or Google citations or both (book titles Sassa et al. 2018a, b are too new to be included into this table)

Type	Book	Chapter	Title	Bookmetrix downloads	Bookmetrix citations (in books & journals)	Google Scholar citations	Scopus citations
WLF0	Sassa et al. 2005	Tommasi et al. 2005	The Landslide Sequence Induced by the 2002 Eruption at Stromboli Volcano	1.71K	5 (0 + 5)	32	n.a.
		Boldini et al. 2005	Mechanism of Landslide Causing the December 2002 Tsunami at Stromboli Volcano (Italy)	1.72K	1 (0 + 1)	13	n.a.
		Sassa 2005	ICL History and Activities	1.82K	0	11	n.a.
WLF1	Sassa and Canuti 2009	Lacasse and Nadim 2009	Landslide Risk Assessment and Mitigation Strategy	3.15K	16 (3 + 13)	62	37
		Hervas and Bobrowsky 2009	Mapping: inventories, susceptibility, hazard and risk	2.96K	12 (0 + 12)	52	33
		Cannon and DeGraff 2009	The Increasing Wildfire and Post-Fire Debris-Flow Threat in Western USA, and Implications for Consequences of Climate Change	2.67K	10 (2 + 8)	38	25
WLF2–1	Margottini et al. 2013a	Raspini et al. 2013	Landslide Mapping Using SqueeSAR Data: Giampilieri (Italy) Case Study	2.22K	10 (1 + 9)	19	14
		Tsangaratos et al. 2013	Case event system for landslide susceptibility analysis	2.18K	6 (0 + 6)	19	12
		Trigila et al. 2013	Landslide susceptibility mapping at national scale: The Italian case study	2.24K	6 (1 + 5)	14	11
		Devoto et al. 2013	Landslides along the north-west coast of the island of Malta	2.17K	4 (1 + 3)	12	10
		Ardizzone et al. 2013	Very high-resolution stereoscopic satellite images for landslide mapping	2.30K	7 (1 + 6)	13	10
		Hermanns et al. 2013a	Systematic Mapping of Large Unstable Rock Slopes in Norway	2.26K	2 (1 + 1)	23	9
WLF2–2	Margottini et al. 2013b	Antronico et al. 2013	Conventional and Innovative Techniques for the Monitoring of Displacements in Landslide Affected Area	2.75K	6 (1 + 5)	9	7
		Tapete et al. 2013	Radar interferometry for early stage warning on monuments at risk	2.74K	2 (0 + 2)	11	10
		Arosio et al. 2013	Freeze-thaw cycle and rockfall monitoring	2.77K	4 (2 + 2)	13	8
WLF2–3	Margottini et al. 2013c	Scheidl et al. 2013	Runout Prediction of Debris Flows and Similar Mass Movements	1.72K	7 (5 + 2)	14	5
		Crosta et al. 2013b	On controls of flow-like landslide evolution by an erodible layer	1.65K	2 (0 + 2)	9	6
		Salvati et al. 2013		1.66K	0	3	6

Table 9 (continued)

Type	Book	Chapter	Title	Bookmetrix downloads	Bookmetrix citations (in books & journals)	Google Scholar citations	Scopus citations
			A new digital catalog of harmful landslides and floods in Italy				
WLF2–4	Margottini et al. 2013d	Avelar et al. 2013	Mechanisms of the Recent Catastrophic Landslides in the Mountainous Range of Rio de Janeiro, Brazil	1.36K	4 (1 + 3)	31	2
		Deline et al. 2013	The December 2008 Crammont Rock Avalanche, Mont Blanc Massif Area, Italy	1.34K	0	36	1
		Springman et al. 2013	Rock glacier degradation and instabilities in the European Alps: A characterization and monitoring experiment in the Turtmanntal, CH	1.33K	3 (0 + 3)	12	9
		Damiano and Mercogliano 2013	Potential effects of climate change on slope stability in unsaturated pyroclastic soils	1.34K	4 (1 + 3)	9	6
WLF2–5	Margottini et al. 2013e	Harp et al. 2013	The Effect of Complex Fault Rupture on the Distribution of Landslides Triggered by the 12 January 2010, Haiti Earthquake	1.38K	3 (0 + 3)	21	5
		Crosta et al. 2013a	Interaction of landslide mass and water resulting in impulse waves	1.31K	3 (0 + 3)	9	7
WLF2–6	Margottini et al. 2013f	Roberts et al. 2013	Impacts of the 2007 Landslide-Generated Tsunami in Chehalis Lake, Canada	0.29K	8 (0 + 8)	13	9
		Coelho Netto et al. 2013	January 2011: The Extreme Landslide Disaster in Brazil	0.20K	2 (0 + 2)	32	3
		Benedetti et al. 2013	San Leo: Centuries of coexistence with landslides	0.15K	2 (0 + 2)	10	11
		Hermanns et al. 2013b	Rockslide dams in Møre og Romsdal County, Norway	0.38K	0	11	9
WLF2–7	Margottini et al. 2013g	Schaub et al. 2013	Landslides and New Lakes in Deglaciating Areas: A Risk Management Framework	1.16K	10 (1 + 9)	23	17
		Trezzini et al. 2013	Landslide and flood: Economic and social impacts in Italy	1.17K	3 (1 + 2)	8	5
WLF3–1	Sassa et al. 2014a	Sassa et al. 2014d	Plenary: Progress in Landslide Dyanmics	1.14K	6 (2 + 4)	17	3
		Pennington et al. 2014	Antecedent precipitation as a potential proxy for landslide incidence in South West United Kingdom	1.13K	4 (2 + 2)	11	7
		Huntley et al. 2014	Fiber optic strain monitoring and evaluation of a slow-moving landslide near Ashcroft, British Columbia, Canada	1.16K	1 (0 + 1)	11	5

Table 9 (continued)

Type	Book	Chapter	Title	Bookmetrix downloads	Bookmetrix citations (in books & journals)	Google Scholar citations	Scopus citations
WLF3–2	Sassa et al. 2014b	Dou et al. 2014	GIS-based landslide susceptibility mapping using a certainty factor model and its validation in the Chuetsu area, central Japan	0.32K	15 (2 + 13)	30	20
		Zizioli et al. 2014	Rainfall-triggered shallow landslides mapping through Pleiades images	0.29K	2 (1 + 1)	9	9
		Klose et al. 2014b	Estimation of direct landslide costs in industrialized countries: Challenges, concepts, and case study	0.29K	2 (1 + 1)	11	8
WLF3–3	Sassa et al. 2014c	Xu et al. 2014b	Did the 2008 Wenchuan earthquake lead to a net volume loss?	0.18K	1 (0 + 1)	7	7
		Hermanns et al. 2014	Approach for systematic rockslide mapping of unstable rock slopes in Norway	0.18K	1 (1 + 0)	11	5
		Crosta et al. 2014	Large slope instabilities in northern Chile: Inventory, characterization and possible triggers	0.18K	1 (0 + 1)	7	5
WLF4–1	Sassa et al. 2017	Klose et al. 2014a	Landslide Hazards and Climate Change Adaptation of Transport Infrastructures in Germany	0.87K	0	3	n.a.
WLF4–2	Mikoš et al. 2017a	Tanteri et al. 2014	Multitemporal UAV Survey for Mass Movement Detection and Monitoring	0.35K	3 (2 + 1)	5	n.a.
WLF4–3	Mikoš et al. 2017b	Hiraoka et al. 2014	A Full-Scale Model Test for Predicting Collapse Time Using Displacement of Slope Surface During Slope Cutting Work	0.40K	0	3	n.a.
WLF4–4	Mikoš et al. 2017c	Baczynski and Bar 2014	Landslide Monitoring and Management Challenge in Remote Papua New Guinea	0.24K	1 (0 + 1)	1	n.a.
WLF4–5	Mikoš et al. 2017d	Emmer and Juřicová 2014	Inventory and Typology of Landslide-Dammed Lakes of the Cordillera Blanca (Peru)	0.12K	2 (0 + 2)	3	3
ICL Monograph	Sassa et al. 2007	McSaveney and Davis 2007	Rockslides and Their Motion	1.94K	17 (1 + 16)	52	46
		Hungr 2007	Dynamics of Rapid Landslides	1.99K	10 (0 + 10)	33	18
		Picarelli 2007	Considerations about the Mechanics of Slow Active Landslides in Clay	1.94K	2 (0 + 2)	17	10
ICL Monograph	Sassa et al. 2013	Mihalić and Arbanas 2013	The Croatian-Japanese joint research project on landslides: Activities and public benefits	1.54K	3 (3 + 0)	31	12
		Nadim et al. 2013	Assessment of Global Landslide Hazard Hotspots	1.66K	3 (1 + 2)	8	5
		Petkovšek et al. 2013	Mechanism of Active Landslides in Flysch	1.57K	3 (1 + 2)	8	5
		Emmer et al. 2014		0.60K	8 (1 + 7)	23	n.a.

Table 9 (continued)

Type	Book	Chapter	Title	Bookmetrix downloads	Bookmetrix citations (in books & journals)	Google Scholar citations	Scopus citations
ICL Monograph	Shan et al. 2014		Glacier Retreat, Lakes Development and Associated Natural Hazards in Cordillera Blanca, Peru				
		Khomutov and Leibman 2014	Assessment of Landslide Zahards in a Typical Tundra of Central Yamal, Russia	0.61K	3 (0 + 3)	9	n.a.
		Leibman et al. 2014	Cryogenic Landslides in the West-Siberian Plain of Russia: Classification, Mechanisms, and Landforms	0.61K	1 (0 + 1)	6	n.a.

n.a. data not available

Comparing the number of chapter citations from the 52 analyzed books related to landslide science, we may conclude that their maximum numbers of citations are far below highly cited journal papers, e.g., from the ICL journal *Landslides*. Sassa et al. (2009) found that after 5 years of the journal *Landslides* (2004–2008), the most cited journal articles received a few tens of Google Scholar citations, and up to 20 ISI WoS citations (Sassa et al. 2009; Table 1). This situation improved a lot in the second 5 years of the journal *Landslides* (2009–2013) since the most cited journal articles received already close to and over 100 Google Scholar citations, and several tens of WoS citations (Sassa et al. 2015, Table 4).

The average number of journal article citations is much higher as for book chapters, even though the total number of article downloads is of the order of several hundred or a few thousand downloads, and not several ten thousand as is the case for book chapters. The rate between journal article citations to their number of downloads is for the journal *Landslides* for the most cited articles up to 1:10. For example, 11 *Highly Cited Papers* in the journal *Landslides* are given in Table 10. The number of downloads per citable item has no significant impact on its total number of received citations.

Landslide-related scientific events

The results so far have shown that articles in conference proceedings are not cited as often as journal articles, and that there are large differences between single chapters in the same conference proceedings and between chapters in different books. However, can we compare series of landslide-related scientific events with regard to their bibliometric impact?

In Google Scholar, we compared selected metrics for the proceedings of World Landslide Forums (ICL), congresses of the International Association for Engineering Geology and the Environment (IAEG), and proceedings of the International Symposium on Landslides (ISL). The results are as follows:

- WLF (2009–2017) reveals 999 papers with on average 3.45 authors per paper, h-index = 15 and g-index = 21 (query words “world landslide forum” plus all WLF proceedings titles);
- IAEG (1970–2016) reveals 696 papers with on average 2.35 authors per paper, h-index = 21, and g-index = 27 (query words “IAEG, NOT conference bulletin bull. conf.”);
- ISL (from third ISL on, 1980–2016) reveals 799 papers with on average 2.73 authors per paper, h-index = 29, and g-index = 64 (query words “international symposium on landslides OR landslides and engineered slopes”).

On the basis of this rough estimation using Google Scholar data, we may conclude that ICL World Landslide Forums are “young” events (since 2009) and cannot compete yet with “established” events such as mature and large IAEG congress (since 1970) or mature and specialized International Symposium on Landslides (since 1972). A re-analysis in a due time will show whether ICL is catching up with these two well-known series of landslide-related events.

Alternative metrics

The bibliometric (scientometric) parameters, presented in this study, are only one part of the story. Alternative metrics are currently one of the most popular research topics in scientometric research, and different services (such as, e.g., *Altmetric.com*) give insight about how and where books are discussed online, i.e., in social media, but also in news articles, blogs, and policy documents. Bornmann (2015) prepared an overview of three of the most important altmetrics: microblogging (Twitter), online reference managers (Mendeley, CiteULike), and blogging—the correlation with traditional citations for microblogging counts was negligible, for blog counts was small, and for bookmark counts from online reference managers, medium to large. The presence and density of social media altmetric counts are still very low and not very frequent among scientific publications, which was shown by Costas et al. (2015). Altmetric measurements derived from the social web are increasingly advocated and used as early indicators of article impact and usefulness, as discussed by Thelwall et al. (2013). The increasing popularity and usage of some social media, e.g., LinkedIn or Researchgate, may well rise research efforts in the field of alternative metrics for scientific impact of published research papers and book chapters, including those produced by the ICL.

Conclusions

We analyzed selected landslide-related 52 books with 3426 chapters published by Springer Nature in the period 2005–2018, using three citation databases: Scopus (by Elsevier), Web of Science (by Clarivate Analytics), and Google Scholar. Out of the selected book titles, 22 were published on behalf of the ICL, with 1419 chapters. The bibliometric analysis was performed as well as on the book level, and as far as possible, on the book chapter level. Based on results of this study, we can draw the following conclusions:

- Web of Science covers less than a third of the selected 52 book titles in the field of landslide science. For the analyzed 22 ICL-related book titles, WoS covers only one title. On the contrary, Google Scholar covers all selected book titles, and Scopus covers more than a half of the analyzed book titles. In the future, more efforts should be invested into bringing more ICL-related book titles to WoS.
- The differences among landslide-related books can be quite large; only a few chapters from analyzed book titles were found to be cited frequently compared to highly cited scientific journal articles. On average, the analyzed 3426 book chapters from 52 landslide-related books have been downloaded over 53,000 times each; 1092 chapters (32%) received 2932 citations (2.68 citations per cited chapter and 0.86 citations per published chapter).
- The selected 52 landslide-related book titles are above the average metrics for the whole Springer eBook Package Earth and Environmental Science with regard to the total number of downloads per book, the total number of citations per book, and the total number of readers per book. The ICL-related books are getting more downloads but less readers and citations (so far) as the selected non-ICL-related books.
- The number of chapter downloads is more or less equal for all chapters in one book and the chapter citations in different citation databases are rather strictly limited to only a small fraction of a few highly cited chapters—many chapters are downloaded as a whole e-Book but are not receiving any attention in the form of a chapter citation. This resembles in a way the situation in journals, where in many cases the journal Impact Factor is produced mainly by a fraction of highly cited papers, and not all journal articles get cited.
- The h-index of the ICL monographs, using chapter citations, is around 10 or less, and therefore much less than the most cited journals in the category geological engineering in the Web of Science (h-index around 50 or more).
- The ICL World Landslide Forum proceedings (since 2009) are with regard to the total amount of citations (h-index, g-index) still behind the more established landslide-related scientific events, such as IAEG congresses (since 1970) and International Symposia on Landslides (since 1970).
- Additional research on the impact of printed and electronic scientific books (scientific and technical monographs and proceedings of scientific meetings) on world scientific community in the fields of landslide research and landslide risk reduction using different altmetrics can be a further step in evaluation of books published by the International Consortium on Landslides (and any other international associations and societies).

A way in raising the visibility and impact of the ICL books on landslide research community would be to support their open

Table 10 Highly cited papers from the journal *Landslides*—comparison between WoS and Bookmetrix citations with Bookmetrix downloads

No.	Authors	WoS citations	Bookmetrix citations	Bookmetrix downloads
1.	Guzzetti et al. 2008	360	341	6.0K
2.	Lee and Pradhan 2007	271	275	2.7K
3.	Yin et al. 2008	202	204	3.7K
4.	Pradhan and Lee 2010	147	157	1.8K
5.	Akgun 2012	127	139	1.5K
6.	Hungr et al. 2014	229	253	9.0K
7.	Xu et al. 2014a	74	83	4.5K
8.	Bui et al. 2016	54	80	2.5K
9.	Li et al. 2016	23	21	1.9K
10.	Yavari-Ramshe and Ataie-Asjtiani 2017	8	9	451
11.	Bui et al. 2017	7	11	542

access publishing in the form of e-Books as much as possible, and to strengthen the ICL presence in social media networks, such as Researchgate or LindkedIn.

For libraries and promotional activities, printed books might be important, but it seems that the impact of published books in the field of landslide science relates much more to the potential of open access and wide distribution of electronic databases than to the number of printed books, distributed to participants at scientific events, sold in bookstores, or available in libraries.

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