International Society for Soil Mechanics and
Geotechnical Engineering

Société Internationale de Mécanique des
Sols et de la Géotechnique

SCIENTIFIC LITERATURE DATABASES AND CITATION QUALITY INDICATORS

A REPORT FOR THE BOARD OF THE INTERNATIONAL SOCIETY FOR SOIL MECHANICS AND FOUNDATION ENGINEERING

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1. Introduction

It is a fact of the current academic environment that the evaluation of individual researchers, funding proposals and even Departments and Universities resort to quantitative indicators related to publication metrics that in turn are based on citation statistics. The availability of rather comprehensive databases incorporating citation data allows the use of those instruments in a generally straightforward manner. Thus, research visibility and academic hiring and promotion have become strongly linked to citation counts.

Of course, evaluation and ranking is not the only (or even the main) aim of citation indices; they are also essential for in-depth exploration of an academic discipline or research topic. As Eugene Garfield, the father of citation indexing of academic literature, wrote:

"Citations are the formal, explicit linkages between papers that have particular points in common. A citation index is built around these linkages. It lists publications that have been cited and identifies the sources of the citations. Anyone conducting a literature search can find from one to dozens of additional papers on a subject just by knowing one that has been cited. And every paper that is found provides a list of new citations with which to continue the search."

However, in this document attention will be mainly focused on citations as indicators of quality and prestige.

This report responds to a request of the Board of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). It briefly covers the following topics: i) databases of scientific literature, ii) criteria for selecting Journals and Proceedings for inclusion in the databases, iii) procedure to apply for inclusion in the databases, and iv) quality indicators based on citations. A summary and some concluding remarks are offered at the end of the report.

A relatively recent development has been the massive inclusion of Conference Proceedings in the databases; initially, only Journal literature was incorporated. It has now been recognized that Conferences are the place where ideas are often first presented and begin their development and that Conference Proceedings is a popular vehicle for scholarly communication in the physical sciences, particularly engineering. Because the ISSMGE is actively involved in many series of Conferences, issues related to Conference Proceedings have been highlighted wherever relevant.

Every effort has been made to ensure the correctness of the content at the time of compiling this report. However, this is a fast-moving area and the information contained herein may become outdated or obsolete in a short period of time. So, caution should be exercised in the future when using or quoting the information provided in this report.

2. The main databases

There are three main scientific publications databases for citation indexing and search service: *Web of Science* (previously known as *Web of Knowledge*), *Scopus* and *Google Scholar*.

2.1 *Web of Science*

The origin of *Web of Science* (http://wokinfo.com/) can be traced back to the Institute for Scientific Information (ISI) founded in 1960 by Eugene Garfield, the initiator of citation indexing and analysis. It was sold in 1992 and it is now the property of Thomson Reuters. *Web of Science* consists of seven online sub-databases:

- Science Citation Index Expanded
- Conference Proceedings Citation Index
- Social Sciences Index Expanded
- Arts & Humanities Citation Index
- Index Chemicus
- Current Chemical Reactions
- Book Citation Index

Web of Science is subscription-based and does not belong to a primary publisher of scientific literature. Overall, *Web of Science* covers 50,000 scholarly books, 12,000 Journals and 160,000 Conference Proceedings resulting in more than 90 million records out of which, 8.2 million records correspond to Conference Proceedings. Nearly 400,000 Conference Proceeding records are added every year.

For the geotechnical community the two first sub-databases are the relevant ones. According to the latest figures available, those two databases cover more than 8,500 J ournals (from 1900 to the present) and 160,000 conference titles (from 1990 to the present). The cited references and cumulative citation counts of Conference Proceedings started in 1999.

The same organization also publishes the yearly *Journal Citation Reports* that is used by many organizations and institutions as a guide to the quality of the Journal. More details are given later.

2.2 *Scopus*

Scopus (https://www.scopus.com/) is a database owned by the publishing company Elsevier. It was created in 2004 and it is subscription-based. Since Elsevier is also one of the main international scientific publishers, an independent Scopus Content Selection and Advisory Board (CSAB) has been established to avoid a conflict of interest in the choice of Journals or Proceedings to be included in the database irrespective of publisher. The present composition of CSAB can be seen in [1].It covers Physical Sciences, Life Sciences, Health Sciences and Social Sciences. Physical Sciences (includes Engineering) account for 30% of the content. About 10% of *Scopus* content is published by Elsevier.

The whole database includes more than 90,000 scholarly books, more than 21,000 peer-reviewed Journals and more than 83,000 worldwide Conferences. Journals account for about 33 million papers (of which 84% include references) and Conference Proceedings for a further 6.8 million papers. Coverage is quite comprehensive from 1996 onwards and an important effort is being made to incorporate information prior to 1996. According to [2] (July 2015), 4 million pre-1996 articles have been added that include 83 million pre-1996 cited references. Elsevier anticipates that by the end of 2016, there will be 12 million complete records (papers) for pre-1996 articles contributing more than 150 million cited references.

A Conference Expansion project was launched in 2013 that has been concluded in 2015 incorporating 6,000 Conference events and 400,000 Conference papers, more than originally envisaged. Currently, Conference coverage represents about 15% of the *Scopus* content.

2.3 *Google Scholar*

The *Google Scholar* database (http://scholar.google.com/), originally released in beta-version in 2004, is in many respects different to the previous two. For instance, it is freely available instead of being subscription-based. Google does not publish the size of *Google Scholar* database but it has been estimated [3] to contain about 160 million documents (May 2014). It has been recently reckoned that *Google Scholar* can find almost 90% of all scholarly documents on the Web written in English. It should be noted, however, that *Google Scholar* does not publish a list of the scientific journals crawled and the frequency of its updates is unknown.

Google Scholar presents results according to a ranking algorithm, the details of which are not published but it has been shown that it puts a high weight on citation counts increasing the so-called Mathew effect[1]. An important development was introduced in 2012 giving the possibility for individual researchers to create personal citations profiles that are public and editable by the authors themselves.

Google Scholar intends to incorporate as many Journals as possible (as well as other scholarly documents) with no specific screening for quality so that predatory journals[2] and other non-peer reviewed journals are readily included. It has also been found that it is vulnerable to spam (complete non-sense articles may be indexed) and, apparently, it is possible to manipulate citation counts. For these reasons, *Google Scholar*, though a very useful tool for searches, is generally not used as a quality indicator and will not be specifically considered in the rest of this report.

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[1] The Matthew effect usually refers to the phenomenon that those with high status/recognition are placed in a more favourable position to gain even more status/recognition. It is based on a biblical verse in the Gospel of Matthew. 'For unto everyone that have shall be given, and he shall have abundance; but him that have not shall be taken, even that which he have.' Matthew 25: 29.

[2] In academic publishing, predatory open access publishing describes an exploitative open-access publishing business model that involves charging publication fees to authors without providing the editorial and publishing services associated with legitimate journals (open access or not).

3. How are Journals and Proceedings selected for inclusion in the databases?

Comprehensive coverage does not mean all-inclusive. Although the amount of information collected by the databases is enormous, they by no means include all the scientific literature produced; indeed *Web of Science* and *Scopus* have rather strict criteria for accepting Journals and Conference Proceedings. In this section, the main guidelines used are briefly described.

Web of Science uses a number of qualitative and quantitative criteria for evaluating Journals. No criterion is considered in isolation, a global assessment is made based on all of them. Covered Journals are evaluated periodically and, if they fail to meet the required standards, they are removed from the database. The main criteria considered are the following ones:

- Timeliness of publication. This is a basic criterion, a journal must publish in accordance with the stated frequency in order to be considered for inclusion in the *Web of Science*. Timeliness indicates a healthy backlog of manuscripts ensuring the necessary continuity. In e-journals that publish in a continuous manner without separate issues, a steady flow of papers over a nine-month period is required.
- The articles must be peer-reviewed. Inclusion of funding acknowledgements is strongly recommended.
- International diversity among contributing authors, editors and editorial board advisory members.
- Citation analysis because all cited references from every Journal covered in *Web of Science* are indexed whether or not the cited work is also covered as a source journal. Excessive self-citation will warrant an investigation to determine whether it is being used to artificially inflate the impact factor.
- The Journal should follow international editorial conventions concerning Journal title, fully descriptive article titles and abstracts, complete bibliographical information for all cited references and address information of the authors.
- Journals with full text in English are preferred although some Journals may have bibliographic information in English and the main text in another language. Journals must have cited references in the Roman alphabet.

The criteria used to accept Conference Proceedings are:

- Basic publishing standards are met. This includes sequential page numbering, timeliness, fully descriptive article titles, complete bibliographical information for all cited references, author abstracts, and keywords.
- Content. The overall quality of research is assessed. Priority is given to important serialized conferences sponsored by prestigious scholarly societies. An objective is to cover every instance of such conference series.
- Conference date. The meeting must have been held in the current or previous four years.
- The full name of the Conference and the location of the meeting must be supplied.

Scopus has published the selection criteria for inclusion in its database [4]. Journals must meet all the following minimum criteria:

- Consist of peer-reviewed content and have a publicly available description of the peer review process
- Be published on a regular basis and have an International Standard Serial Number (ISNN) as registered with the ISSN International Centre
- Have content that is relevant for and readable by an international audience, meaning: have references in Roman script and have English language abstracts and titles
- Have a publicly available publication ethics and publication malpractice statement

Additionally, it is general policy that a journal needs to have a publication history of at least two years before it can be reviewed for *Scopus* coverage.

If those criteria are met, the proposed title will be evaluated by the CSAB according to a series of criteria grouped in 5 categories. They are listed in Table 1.

Table 1. Criteria for acceptance of a Journal in the *Scopus* database

Category	**Criteria**
Journal Policy	Convincing editorial policy Type of peer review Diversity in geographical distribution of editors Diversity in geographical distribution of authors
Content	Academic contribution to the field Clarity of abstracts Quality of and conformity to the stated aims and scope of the journal Readability of articles
Journal Standing	Citedness of journal articles in Scopus Editor standing
Publishing Regularity	No delays or interruptions in the publication schedule
Online Availability	Full journal content available online English language journal home page available Quality of journal home page

Concerning Conference Proceedings, *Scopus* only covers full-text conference papers. The selection of Conferences is based on the relevancy and quality of the conference in relation to the subject field. Priority is given to conferences published by reputable organizations and publishers in relevant subject fields. *Scopus* does not consider individual conference suggestions for inclusion in the database.

4. How to apply for inclusion on the databases

To start the evaluation process of a Journal for *Web of Science*, the publisher must deliver to Thomson Reuters three consecutive current issues, one at time, as they are published. Issues may be submitted in print, online or both. For the print option, the following should be used: Publications Processing, Thomson Reuters, 1500 Spring Garden Street, Fourth Floor, Philadelphia, PA 19130, USA. Submission of a Journal online should be made to:
http://ip-science.thomsonreuters.com/info/journalsubmission/

Because the start of the evaluation may be delayed, the publishers or editors should continue sending timely issues until the evaluation has been concluded. According to [5], about 2000 journal titles for inclusion in *Web of Science* are received every year, only around 10-12% are accepted for coverage.

Concerning the Conference Proceedings, the procedure to submit them for evaluation is detailed in [6]. The main points are summarised here. The Proceedings have to be supplied in either print or electronic format (PDF), electronic is preferred. For electronic submission, a link from which the PDFs can be downloaded should be provided. Proceedings on CD, DVD or sent by e-mail are not accepted. Only one of the options (print or electronic) should be used. The same addresses as for Journals can be used. According to Thomson Reuters, the procedure is highly selective and can take several months. There is no cost involved. As mentioned previously, the Conference must have been held in the current or previous four years.

Suggestions for inclusion in *Scopus* may come from librarians, publishers and editors. They can be submitted using the web form in the *Scopus* site: http://suggestor.step.scopus.com/suggestTitle/step1.cfm provided the minimum selection criteria are met and then the CSAB will make a decision based on the criteria indicated in the previous section. Conference Proceedings are eligible for *Scopus* review if they are serial and meet the *Scopus* minimum journal selection criteria. Eligible Conference Proceedings are reviewed in the same way as Journals. People suggesting new content will receive feedback on the reasons for acceptance or rejection. For questions about the evaluation process, it is possible to contact *Scopus* by e-mail at titlesuggestion@scopus.com. If the process is started early enough, it has proved possible to have the papers included in *Scopus* before the start of the Conference.

5. Quality indicators based on citations

As noted above, the use of quality indicators based on citations is fast becoming widespread and influential. They can refer to Journals, individuals, Institutions and even whole countries. Here below, the main ones referring to Journals and individual researchers are briefly presented. It should be noted that the widespread access to electronic versions of the Journals can give rise to new indicators based on other parameters such as number of downloads, views or even tweets (tweetations); indeed a Twimpact factor has already been proposed. Those indicators are, however, still not widely contemplated,

5.1 *Quality indicators for Journals*

The most influential indicator for Journal is the "Impact Factor" (*IF*). The Impact Factor of an academic Journal is a measure that reflects the average number of citations to recent articles published in the Journal. It was devised by Eugene Garfield, the founder of the Institute of Scientific Information (ISI).

The impact factor of a journal is calculated as the average number of citations received per paper published in that journal during the two preceding years (this includes citations from all content, including non-peer-reviewed content like editorials). For instance, the 2014 impact factor (*IF*) of a journal can be computed as

$$2014\ IF = m/n$$

where m = the number of times that the papers published in 2012 and 2013 were cited by indexed publications in 2014,
and n = the total number of papers published by the journal in 2012 and 2013.

As an example, the top 20 Journals according to the 2014 impact factor in the *Journal Citation Reports* category of "Engineering, Geological" are listed in Appendix 1.

Impact factors are calculated yearly (since 1975) and are limited to the Journals indexed in ISI's *Journal Citation Reports*. It should be noted that the *IF* depends strongly on the scientific field and should not be used to compare Journals in different research areas. With some exceptions, engineering impact factors tend to be lower than in other disciplines.

The *IF* as defined above has many shortcomings but it is used very widely to assess the quality of the Journal and it is a metric that most editors watch very closely. Indeed there are some dubious practices that some Journals use to enhance the impact factor value such as soliciting references to the Journal during the reviewing period prior to publication (coercive citation). Other more reputable practices that increase the *IF* is the publishing of review articles (they tend to receive more citations), the invitation to senior scientists to contribute or to publish the papers most likely to be cited at the beginning of the year. In contrast, case histories, though very useful in geotechnical engineering, tend to receive fewer citations. In any case, there is a general trend in recent years for impact factors to become higher due to the increased inclusion of Conference Proceedings in the database.

In geotechnical engineering, many citations occur well after the two-year period used in evaluating the impact factor, a fact that it is sometimes due to the long time required for a paper to get published in some Journals. In this respect, an alternative impact factor, the 5-years impact factor also provided in the *Journal Citation Reports*, may be a more useful indicator. However, as can be seen in Appendix 2, Journal classification does not change significantly.

There also other indicators in the *Journal Citation Reports* that provide useful information such as “Total cites”, “Immediacy index” or “Cited half-life” but they are seldom used in the evaluation of Journals. The same can be said of the “Eigenfactor score” (a 'prestige metrics' that follows the type of approach used by Google PageRank) and the “Article Influence Score” that are now also listed in the *Journal Citation Reports.*

Because of the shortcomings of the *IF*, there has been a steady suite of pronouncements from Editors’ Associations and Funding Agencies urging to evaluate articles directly and not according to the Impact Factor of the Journal where they are published. Indeed Eugene Garfield (the originator of the impact factor) warns of the misuse of the IF in evaluating individuals due to the wide variation of quality from article to article within the same Journal. Some Agencies (for instance the Australian Research Council in its initiative “Excellence in Research for Australia”) do not use the impact factor to classify Journals but rely on a variety of inputs; one of them is the opinion of the researchers in each particular field.

It can be said however that the use of the *IF* has a large and widespread influence on the way scientific research is considered and evaluated.

More recently (2008), Elsevier has put forward another set of indicators based on the *Scopus* database that are gaining acceptance. They are: *IPP* (Impact per Publication), *SNIP* (Source Normalized Impact per Paper) and *SJR* (SCImago Journal Rank). They are briefly described and discussed in Appendix 3.

5.2 *Quality indicators for individual researchers*

It is obviously difficult to devise quality indicators for individual researchers; for instance, a mere sum of all the papers published favours quantity over quality. As indicated above, the Journal where a paper is published is sometimes taken as an indicator of its quality but this ignores the fact that a Journal unavoidably contains papers of highly variable quality.

A more reliable guide to the importance of a paper is the number of citations that it has attracted (except in the very limited instances where the paper is cited for negative reasons). Thus the total number of citations (a figure that it is readily provided by the various databases) or the mean citations per paper can be considered better indicators to the value of an individual researcher. However, those indicators (though valuable) are a rather blunt tool for evaluation purposes.

In this context, the *h-index* has become a very popular indicator to estimate the productivity and citation impact of a scientist. The index was created in 2005 by J.E. Hirsch [7] a physicist in the University of California, San Diego.

To calculate the *h-index* it is necessary to have the list of the papers published by the researcher ordered by the number of citations. The researcher will have a value of *h-index* equal to ***h*** if his/her ***h*** most-cited papers have more than ***h-1*** citations (see Figure 1). In other words, a researcher has an *h-index* of ***h*** if he/she has published ***h*** papers each of which has been cited in other papers at least ***h*** times.

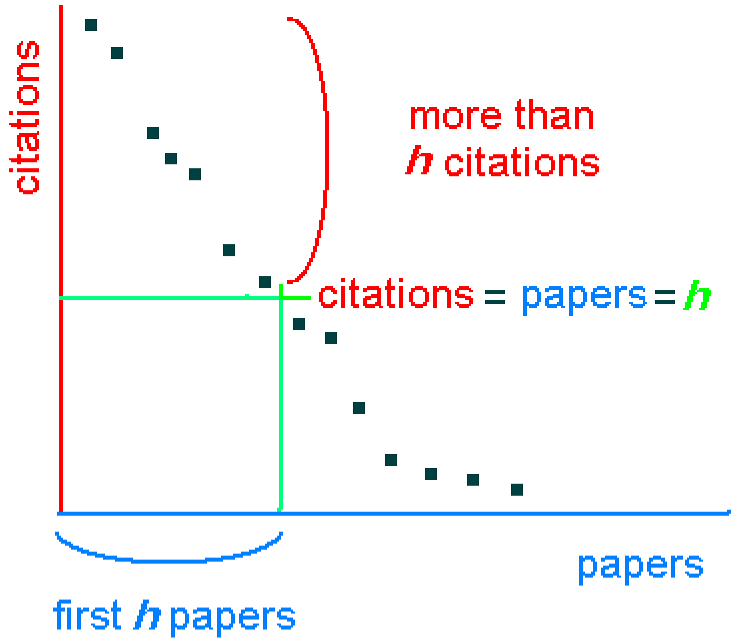

Figure 1. Graphical definition of the *h-index*

Hirsch intended the *h-index* to correct the main disadvantages of other indicators as total number of papers or total number of citations. The total number of papers does not take into account their quality whereas the total number of citations can be disproportionally affected by a single publication of major influence or by a large number of citations with few citations each. *h-index* tries to account for quality and quantity simultaneously. Naturally the *h-index* is strongly influenced (like any other citation measure) by the scientific field where it is applied, so it should only be used for comparing researchers working in the same field.

All databases compute the *h-index* if requested. Each database produces different values of *h-index* because of different coverage. Generally *Google Scholar* yields the highest *h-index* and *Web of Science* the lowest. For instance, for an (unnamed) geotechnical researcher, the following figures have been obtained (August 2015):

- *Web of Science* Total citations: 4265. *h-index*: 29
- *Scopus* Total citations: 5457. *h-index*: 35
- *Google Scholar* Total citations: 10268. *h-index*: 49

As stated above, many Institutions or Agencies do not consider the results from *Google Scholar* because it provides more opportunities for manipulation. The *h-index* can also be enhanced by unnecessary self-citations and it naturally increases with the length of the career of the researcher. Also, it does not take into account the number of authors or the researcher placement in the author's list, which in some research areas or institutions is significant. As a matter of interest, Hirsch [8] reported that the h-index is better than other indicators (total papers, total citations, citations per paper) at predicting future scientific achievement

The *h-index* is very versatile, it can be applied in the same way to Institutions, Universities, Departments, countries or Journals. For the same reasons as for individual researchers, longer-established Journals will tend to have higher *h-index* values.

Some additional indices have been proposed to correct some of the shortcomings of the *h-index* or to provide additional information. Thus the *m-index*, introduced by the creator of the *h-index*, is defined as the *h-index* divided by the number of years since the researcher's first publication. The index is meant to normalize the *h-index* so that early- and late-stage scientists can be compared.

The *h-index* is not significantly affected if the researcher has a small number of exceptionally well-cited articles that may represent landmarks in the field. It is sometimes felt that such exceptional contributions should be recognized. To address this issue the *g-index* has been proposed. It is defined as the top *g* articles that have received at least g^2 citations. With the same aim, the *e-index* is computed as the square root of the sum of the "excess" citations in the papers that contributed to the *h-index* (see Figure 2).

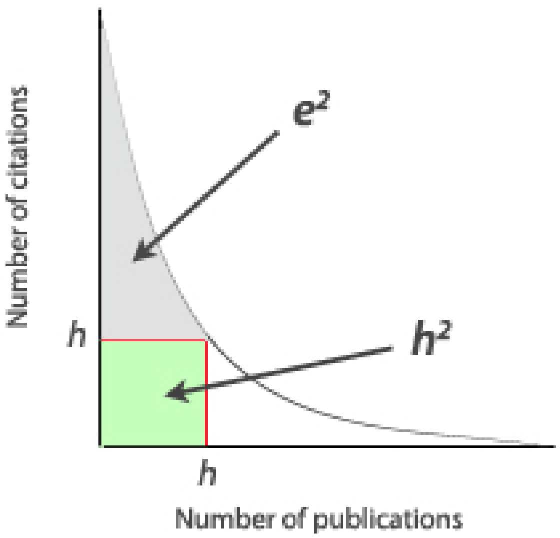

Figure 2. Graphical definition of the *e-index*

6. Summary and concluding remarks

Databases of scientific literature are a key tool for gaining in-depth knowledge of any research field. In addition, since they also provide data of the citations that each paper has received, they are extensively used to establish quality indicators for Universities and other Institutions as well (and especially) for Journals and individual researchers. They have become very important in awarding research funding as well as in a number of career events such as hiring, promotion or the award of tenure.

The most established database is *Web of Science* but a more recent one, *Scopus*, is fast gaining a very similar recognition. Both are subscription-based. In contrast, the freely available *Google Scholar* is seldom accepted for evaluation purposes. In spite of the wider coverage, the lack of sufficient quality control of its content and the apparent potential for some manipulation explains that *Google Scholar* is seldom considered suitable as a basis for quality indicators.

Both *Web of Science* and *Scopus* set a number of criteria for acceptance in their databases. They are presented and briefly discussed in Section 3. Although they independently monitor scientific literature to identify potential new sources, they also provide procedures for suggesting titles for inclusion in the databases, as explained in Section 4.

The main quality indicators for Journals and individual researchers are presented and discussed in Section 5. The most widely used ones are the Impact Factor (*IF*) for Journals and the *h-index* for individual researchers. Their advantages and disadvantages have been indicated. Although a number of alternative or complementary quality measures have also been proposed, at present *IF* and *h-index* are the most influential parameters in the assessment of Journals and individual research performance.

An important development for the ISSMGE is the increasing number of Conference Proceedings that are being included in the databases. It is now widely recognized that Conference Proceedings is a popular vehicle for scholarly communication in the physical sciences, particularly engineering. *Web of Science* gives priority to important serialized conferences sponsored by prestigious scholarly societies. *Scopus* indicates that priority is given to serialized conferences published by reputable organizations and publishers in relevant subject fields. Consequently, Conferences sponsored by ISSMGE should have an excellent chance to be included in the databases, especially considering that they are usually arranged in series. Serial Conference Proceedings involve not only the ISSMGE's International and Regional Conferences, but many others organized by TCs as well. Selection of a reputable publisher will also aid in the evaluation process. As a matter of fact, a significant number of geotechnical Conferences have already been indexed but there are many others that they are still not being incorporated in the databases (see, for instance, Appendix 5).

The procedures to apply for inclusion of Conference Proceedings in the databases are presented in Section 4 (although they may be subject to change). Normally, this task should be undertaken by the publisher but if they do not do so, the organizers can take the initiative in applying. *Web of Science* generally takes longer to reach a decision on database inclusion but, in several instances, it has proved possible for the papers in a Conference to be included in the *Scopus* database prior to the start of the meeting. Note that *Web of Science* accepts proposals for inclusion of Conferences held in the past four years. So, there may be still an opportunity to index Proceedings that were not incorporated at the time of the Conference.

In our opinion, the ISSMGE Board should adopt a policy encouraging organizers to ensure that their Proceedings are indexed in the *Web of Science* and *Scopus* because their inclusion in the databases will increase visibility of the Conference content and guarantee the incorporation of all citations in the quality indicators. If successful, this will be an added incentive for delegates to contribute to and attend the Conference. It is advisable that all the Conferences in a series are properly indexed without gaps; this will make it easier the future inclusion of Conferences in the same series.

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Appendix 1. Top 20 Journals according to the 2014 impact factor in the ISI's category of Engineering, Geological

Mark	Rank	Abbreviated Journal Title (linked to journal information)	ISSN	JCR Data: Total Cites	JCR Data: Impact Factor	JCR Data: 5-Year Impact Factor	JCR Data: Immediacy Index	JCR Data: Articles	JCR Data: Cited Half-life	Eigenfactor® Metrics: Eigenfactor® Score	Eigenfactor® Metrics: Article Influence® Score
☐	1	LANDSLIDES	1612-510X	1310	2.870	3.205	0.329	85	5.4	0.00305	0.875
☐	2	ACTA GEOTECH	1861-1125	386	2.493	1.778	0.395	81	2.7	0.00147	0.643
☐	3	ROCK MECH ROCK ENG	0723-2632	1871	2.420	2.373	0.224	156	6.5	0.00442	0.768
☐	4	EARTHQ ENG STRUCT D	0098-8847	5739	2.305	2.502	0.306	124	>10.0	0.00863	1.042
☐	5	B EARTHQ ENG	1570-761X	1146	1.884	2.094	0.416	125	3.9	0.00511	0.841
☐	6	GEOTECHNIQUE	0016-8505	7006	1.868	2.242	0.379	87	>10.0	0.00744	1.027
☐	7	ENG GEOL	0013-7952	6140	1.744	2.259	0.431	202	8.8	0.00866	0.674
☐	8	INT J ROCK MECH MIN	1365-1609	8085	1.686	2.312	0.220	227	>10.0	0.00841	0.692
☐	9	GEOSYNTH INT	1072-6349	631	1.676	1.591	0.483	29	6.4	0.00101	0.361
☐	10	COMPUT GEOTECH	0266-352X	2368	1.632	1.960	0.357	171	5.9	0.00766	0.827
☐	11	J GEOTECH GEOENVIRON	1090-0241	5485	1.600	1.921	0.366	175	9.0	0.01071	0.806
☐	12	INT J NUMER ANAL MET	0363-9061	2867	1.377	1.590	0.293	99	9.7	0.00621	0.737
☐	13	CAN GEOTECH J	0008-3674	5020	1.332	1.478	0.278	115	>10.0	0.00617	0.703
☐	14	EARTHQ SPECTRA	8755-2930	2643	1.321	1.474	2.096	83	7.9	0.00467	0.795
☐	15	SOIL DYN EARTHQ ENG	0267-7261	3073	1.215	1.668	0.189	185	7.5	0.00748	0.626
☐	16	INT J GEOMECH	1532-3641	885	1.199		0.162	74	6.1	0.00236	
☐	17	J EARTHQ ENG	1363-2469	1215	1.175	1.355	0.186	59	7.9	0.00340	0.703
☐	18	Q J ENG GEOL HYDROGE	1470-9236	783	1.013	0.947	0.407	27	>10.0	0.00081	0.269
☐	19	GEOTECH LETT	2049-825X	94	1.000	1.100	0.119	42		0.00081	0.636
☐	20	ENVIRON ENG GEOSCI	1078-7275	343	0.977	0.824	0.167	24	>10.0	0.00056	0.296

Appendix 2. Top 20 Journals according to the 2014 5-year impact factor in the ISI's category of Engineering, Geological

Mark	Rank	Abbreviated Journal Title (linked to journal information)	ISSN	JCR Data						Eigenfactor® Metrics	
				Total Cites	Impact Factor	5-Year Impact Factor	Immediacy Index	Articles	Cited Half-life	Eigenfactor® Score	Article Influence® Score
☐	1	LANDSLIDES	1612-510X	1310	2.870	3.205	0.329	85	5.4	0.00305	0.875
☐	2	EARTHQ ENG STRUCT D	0098-8847	5739	2.305	2.502	0.306	124	>10.0	0.00863	1.042
☐	3	ROCK MECH ROCK ENG	0723-2632	1871	2.420	2.373	0.224	156	6.5	0.00442	0.768
☐	4	INT J ROCK MECH MIN	1365-1609	8085	1.686	2.312	0.220	227	>10.0	0.00841	0.692
☐	5	ENG GEOL	0013-7952	6140	1.744	2.259	0.431	202	8.8	0.00866	0.674
☐	6	GEOTECHNIQUE	0016-8505	7006	1.868	2.242	0.379	87	>10.0	0.00744	1.027
☐	7	B EARTHQ ENG	1570-761X	1146	1.884	2.094	0.416	125	3.9	0.00511	0.841
☐	8	COMPUT GEOTECH	0266-352X	2368	1.632	1.960	0.357	171	5.9	0.00766	0.827
☐	9	J GEOTECH GEOENVIRON	1090-0241	5485	1.600	1.921	0.366	175	9.0	0.01071	0.806
☐	10	ACTA GEOTECH	1861-1125	386	2.493	1.778	0.395	81	2.7	0.00147	0.643
☐	11	SOIL DYN EARTHQ ENG	0267-7261	3073	1.215	1.668	0.189	185	7.5	0.00748	0.626
☐	12	GEOSYNTH INT	1072-6349	631	1.676	1.591	0.483	29	6.4	0.00101	0.361
☐	13	INT J NUMER ANAL MET	0363-9061	2867	1.377	1.590	0.293	99	9.7	0.00621	0.737
☐	14	CAN GEOTECH J	0008-3674	5020	1.332	1.478	0.278	115	>10.0	0.00617	0.703
☐	15	EARTHQ SPECTRA	8755-2930	2643	1.321	1.474	2.096	83	7.9	0.00467	0.795
☐	16	J EARTHQ ENG	1363-2469	1215	1.175	1.355	0.186	59	7.9	0.00340	0.703
☐	17	B ENG GEOL ENVIRON	1435-9529	882	0.760	1.112	0.160	94	7.2	0.00155	0.322
☐	18	GEOTECH LETT	2049-825X	94	1.000	1.100	0.119	42		0.00081	0.636
☐	19	EARTHQ ENG ENG VIB	1671-3664	566	0.729	0.951	0.029	70	6.5	0.00153	0.363
☐	20	Q J ENG GEOL HYDROGE	1470-9236	783	1.013	0.947	0.407	27	>10.0	0.00081	0.269

Appendix 3. Indicators based on the *Scopus* database

These indicators are calculated using the *Scopus* database and they are freely available in Internet (http://www.journalmetrics.com/). In contrast to *Journal Citation Reports*, they only use peer-reviewed document types (articles, conference papers, and review papers) making them somewhat less susceptible to potential manipulation.

The *IPP* (Impact per Publication) is computed in the same way as the *Journal Citation Reports* Impact Factor but considering a three-year window instead of a two-year one. The same length of citation window is used in the following two metrics.

The *SNIP* (Source-Normalized Impact per Paper) measures a source's citation impact taking into account characteristics of the source's subject field, especially the frequency at which authors cite other papers in their reference lists, the speed at which citation impact matures, and the extent to which the database used in the assessment covers the field's literature. *SNIP* is the ratio of a source's average citation count per paper, and the 'citation potential' of its subject field. It aims to allow direct comparison of sources in different subject fields.

The most relevant metric for the purposes of this report is the *SJR* (SCImago Journal Rank). Developed by Professors Félix de Moya-Anegón and Vicente Guerrero-Bote [9, 10], *SJR* is a prestige metric based on the idea that 'all citations are not created equal'. With *SJR*, the subject field and the quality and reputation of the journal have a direct effect on the value of a citation. It is inspired by the Google PageRank algorithm and based on the eigenvector centrality measure used in network theory. A source transfers its own 'prestige', or status, to another source through the act of citing it. A citation from a source with a relatively high *SJR* is worth more than a citation from a source with a lower *SJR*. It thus accounts for both the number of citations received by a journal and the importance or prestige of the Journals where such citations come from. A source's prestige for a particular year is shared equally over all the citations that it makes in that year; this is important because it corrects for the fact that typical citation counts vary widely between subject fields. Therefore *SJR* can also in principle be used for journal comparisons in science evaluation processes.

The top 20 Journals according to the 2014 *SJR* in the category of Geotechnical Engineering and Engineering Geology are shown in Appendix 4. The *SJR* is computed for many more Journals than those covered by the *Journal Citation Reports.* Thus, whereas the *SJR* listing of Geotechnical Engineering and Engineering Geology contains 154 Journals, the category of Engineering, Geological of the *Journal Citation Reports* considers only 32.

Appendix 4. Top 20 Journals according to the 2014 SJR in the category of Geotechnical Engineering and Engineering Geology

	Title	Type	SJR	H index	Total Docs. (2014)	Total Docs. (3years)	Total Refs.	Total Cites (3years)	Citable Docs. (3years)	Cites / Doc. (2years)	Ref. / Doc.	Country
1	Geotechnique	j	Q1 3,667	80	59	335	1.653	794	284	2,72	28,02	
2	Earthquake Engineering and Structural Dynamics	j	Q1 3,160	75	127	356	4.137	1.027	350	2,82	32,57	
3	Journal of Geotechnical and Geoenvironmental Engineering - ASCE	j	Q1 2,410	86	186	534	5.566	1.076	449	2,18	29,92	
4	Computers and Geotechnics	j	Q1 2,158	53	170	364	5.976	1.003	352	2,48	35,15	
5	Geotextiles and Geomembranes	j	Q1 2,086	48	73	187	2.371	598	170	3,49	32,48	
6	Geosynthetics International	j	Q1 1,990	34	22	98	1.077	175	90	2,13	48,95	
7	Canadian Geotechnical Journal	j	Q1 1,972	69	95	403	3.653	643	337	1,81	38,45	
8	International Journal of Rock Mechanics and Minings Sciences	j	Q1 1,849	80	219	482	7.244	1.331	480	2,30	33,08	
9	Tunnelling and Underground Space Technology	j	Q1 1,832	47	161	342	4.615	839	332	2,22	28,66	
10	Shiyou Kantan Yu Kaifa/Petroleum Exploration and Development	j	Q1 1,820	26	101	261	2.462	607	261	2,61	24,38	
11	Ocean Modelling	j	Q1 1,675	50	69	240	3.667	647	232	2,66	53,14	
12	Geothermics	j	Q1 1,669	37	103	88	3.579	316	84	2,98	34,75	
13	Soils and Foundations	j	Q1 1,597	43	103	253	3.194	450	245	1,98	31,01	
14	Journal of Earthquake Engineering	j	Q1 1,549	41	59	186	1.924	266	182	1,31	32,61	
15	IEEE Geoscience and Remote Sensing Letters	j	Q1 1,534	53	465	824	7.369	2.307	791	2,69	15,85	
16	Bulletin of Earthquake Engineering	j	Q1 1,533	27	183	307	5.856	568	274	1,81	32,00	
17	Rock Mechanics and Rock Engineering	j	Q1 1,516	36	267	308	7.829	680	278	2,49	29,32	
18	Earthquake Spectra	j	Q1 1,480	55	85	278	2.656	444	264	1,44	31,25	
19	International Journal for Numerical and Analytical Methods in Geomechanics	j	Q1 1,468	54	102	376	3.816	709	361	1,82	37,41	
20	SPE Journal	j	Q1 1,397	55	100	281	3.439	671	280	2,01	34,39	

Appendix 5. Index status of the International Conferences of the ISSMGE

As an example, the following Table presents the index status of the Proceedings of the series of ISSMGE International Conferences since 1981. It can be noted that the indexing is very irregular and without any discernible pattern. It is unclear whether the inclusion in the databases has resulted from the action of Publishers or Organizers or they have been incorporated by the databases organizations themselves.

Table: Index status of the ICSMGE International Conferences from 1981 to present

Year	Conference	Location	Publisher	Indexed in *Web of Science*	Indexed in *Scopus*
1981	10th ICSMFE	Stockholm	Balkema	No	Yes
1985	11th ICSMFE	San Francisco	Balkema	No	Yes
1989	12th ICSMFE	Rio de Janeiro	Balkema	Yes	Yes
1994	13th ICSMFE	New Delhi	Oxford & IBH Publ.	Yes	No
1997	14th ICSMFE	Hamburg	Balkema	Yes	No
2001	15th ICSMGE	Istanbul	Balkema	Yes	No
2005	16th ICSMGE	Osaka	Millpress	Yes	Yes
2009	17th ICSMGE	Alexandria	IOS Press	No	Yes
2013	18th ICSMGE	Paris	Presses des Ponts	No	No