Citation Metrics

Linda Galloway and Anne Rauh
Syracuse University Library Learning Commons
April 4, 2013
What are citation metrics?

• Metrics to gauge scholarly impact
• They measure:
  – Quantity of publications *(tweets, blog posts, mentions...)*
  – Quality of publications, how many citations a work receives *(saves, downloads, likes...)*
  – Where the funding comes from
  – Technology transfer, patents, start-ups, etc.
Why use citation metrics?

• Citation metrics are used in promotion and tenure decisions

• Prestige and influence
  – Within a field
  – Within an institution
  – Comparison to peer and aspirational institutions

• Vanity
  – Individual and institutional
Two types of metrics

• Journal level metrics – measure quality of a journal

• Author level metrics – measure the output and reception of individual’s work
Journal level metrics

• Journal Impact Factor
• Immediacy Index
• Eigenfactor Score
Journal Impact Factor

- Most popular journal metric
- Used to compare different journals within a certain field
- Defined as the number of citations to articles in that journal in previous two years, divided by number of original research articles and reviews published by that journal in the previous two years
- Only applies to journals indexed in Web of Knowledge
Additional journal metrics

- **Immediacy Index** - average number of times an article is cited in the year it is published. Indicates how quickly articles in a journal are cited (relevance).

- **Eigenfactor Score** – Evaluates the importance of each journal while normalizing for citation differences across disciplines. The sum of the Eigenfactor Scores for all journals listed in Thomson's Journal Citation Reports (JCR) is 100.
Gender Composition of Scholars (1665-2011)

http://www.eigenfactor.org/gender/
Journal level tools

• **Journal Citation Reports** – Thomson Reuters product; expensive but well known and well regarded

• **SCImago Journal & Country Rank** – Open access evaluation that includes the journals and country scientific indicators developed from the information contained in the [Scopus®](https://www.scopus.com) database.
# Journal Citation Report

## Journal: NATURE

<table>
<thead>
<tr>
<th>Mark</th>
<th>Journal Title</th>
<th>ISSN</th>
<th>Total Cites</th>
<th>Impact Factor</th>
<th>5-Year Impact Factor</th>
<th>Immediacy Index</th>
<th>Citable Items</th>
<th>Cited Half-life</th>
<th>Citing Half-life</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>NATURE</td>
<td>0028-0836</td>
<td>526505</td>
<td>36.280</td>
<td>36.235</td>
<td>9.690</td>
<td>841</td>
<td>9.4</td>
<td>5.1</td>
</tr>
</tbody>
</table>

[Related links]
SCImago Journal & Country Rank

**Nature**

Country: United Kingdom

Subject Area: Multidisciplinary

Subject Category: Multidisciplinary

Publisher: Nature Publishing Group. Publication type: Journals. ISSN: 00280836, 14764687

Coverage: 1869-2012

H Index: 734
Author level metrics

• H-index - measures both the productivity and impact of the published work of a scientist or scholar (a scientist has index h if h of his/her Np papers have at least h citations each, and the other (Np – h) papers have no more than h citations each)

• Simple citation counts – how many times an author has been cited
Scopus or Web of Science?

Scopus
SciVerse Scopus is the world’s largest abstract and citation database of peer-reviewed literature.
- Contains 47 million records, 70% with abstracts
- Nearly **19,500** titles from 5,000 publishers worldwide
- Includes over 4.9 million conference papers
- Interoperability with Engineering Village & Reaxys
- Provides 100% Medline coverage

**SU subscription includes:**
- 26 million records with references back to 1996 (of which 78% include references).
- 21 million records pre-1996 which go back as far as 1823.

Web of Science
*Web of Science* consists of nine databases containing information gathered from thousands of scholarly journals, books, book series, reports, conferences, and more.
- It fully covers over **12,000** major journals.
- Create a visual representation of citation relationships with Citation Mapping
- Capture citation activity and trends graphically with Citation Report
- Use the Analyze Tool to identify trends and patterns

**SU subscription includes:**
- Science Citation Index Expanded (1899-present)
- Social Sciences Citation Index (1898-present)
- Arts & Humanities Citation Index (1975-present)

As of 10/2012
Cited reference search in Scopus

**Tips:**
- Create an account to save your work
- Check within each author group for publications
- Merge author profiles, if necessary

### Make Author Selection

<table>
<thead>
<tr>
<th>Author Last Name</th>
<th>Initials or First Name</th>
<th>Show exact matches only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Affiliation:**
- Eg., university of toronto

---

**Author results: 7 of 11 | Show Profile Matches with One Document**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Documents</th>
<th>Subject Area</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks, Susan E.</td>
<td>24</td>
<td>Agricultural and Biological Sciences; Physics and Astronomy; Medicine;</td>
<td>Pennsylvania State University</td>
</tr>
<tr>
<td>Parks, Sharyn E.</td>
<td>11</td>
<td>Medicine; Psychology; Environmental Science;</td>
<td>National Center for Injury Prevention and Control</td>
</tr>
<tr>
<td>Parks, Sophie E.</td>
<td>9</td>
<td>Agricultural and Biological Sciences; Environmental Science; Chemistry;</td>
<td>NSW Department of Primary Industries</td>
</tr>
<tr>
<td>Parks, Elizabeth S.</td>
<td>8</td>
<td>Immunology and Microbiology; Medicine; Multidisciplinary;</td>
<td>New York University Langone Medical Center</td>
</tr>
<tr>
<td>Parks, Stephen E.</td>
<td>7</td>
<td>Biochemistry, Genetics and Molecular Biology; Medicine</td>
<td>Greenwood Genetics Center</td>
</tr>
</tbody>
</table>

**Refine results:**
- Limit to
- Exclude

**Source Title:**
- Acta Horticulturae
- Advances in Experimental Medicine and Biology
- Agricultural Water Management
- American Journal of Kidney Disease
- American Journal of Medical Genetics

**Affiliation:**
- Centers for Disease Control and Prevention
- Cornell Lab of
Citation overview

Citations received since 1996

This is a citation overview for a set of 24 documents.

Overview options

Exclude from citation overview: Self citations of all authors
Sort documents: Date range
Year descending: 2007 to 2012

Update overview

<table>
<thead>
<tr>
<th>24 Cited Documents</th>
<th>Save list</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>1</td>
<td>2012 Evidence that ship noise increases...</td>
</tr>
<tr>
<td>2</td>
<td>2012 Changes in vocal behavior of Nor...</td>
</tr>
<tr>
<td>3</td>
<td>2012 What does ecosystem acoustics require...</td>
</tr>
<tr>
<td>4</td>
<td>2012 Characteristics of gunshot sound...</td>
</tr>
<tr>
<td>5</td>
<td>2012 Dangerous diving: Surface foraging...</td>
</tr>
<tr>
<td>6</td>
<td>2011 Sound production behavior of incl...</td>
</tr>
<tr>
<td>7</td>
<td>2011 Seasonal trends in acoustic dete...</td>
</tr>
<tr>
<td>8</td>
<td>2011 Evidence for simultaneous sound...</td>
</tr>
<tr>
<td>9</td>
<td>2011 Population-level lateralized fee...</td>
</tr>
<tr>
<td>10</td>
<td>2011 Annual changes in the winter son...</td>
</tr>
<tr>
<td>11</td>
<td>2011 Individual right whales call for...</td>
</tr>
<tr>
<td>12</td>
<td>2011 Diagnosis of a neurodegenerative...</td>
</tr>
</tbody>
</table>

Document h index

h index = 7

View h-Graph

Of the 24 documents considered for the h index, 7 have been cited at least 7 times.

Scopus does not have complete citation information for articles published before 1996.

About h-Graph
Cited reference search in Web of Science

Cited Reference Search  (Find the articles that cite a person's work)

Step 1: Enter information about the cited work. Fields are combined with the Boolean AND operator.

* Note: Entering the title, volume, issue, or page in combination with other fields may reduce the number of cited reference variants found.

Tips:
✓ Create an account to save your work
✓ By default, citation counts are for All Years – you must modify for your chosen parameters
✓ Read the ‘Cited Reference Search’ how-to and follow the directions closely

Current Limits: (To save these permanently, sign in or register.)

Timespan
- All Years  (updated 2012-11-23)
- Date Range
  - From: 2007-01-01 to: 2012-11-25

Citation Databases
**Cited Reference Search**  (Find the articles that cite a person's work)

**Step 2:** Select cited references and click "Finish Search."

Hint: Look for cited reference variants (sometimes different pages of the same article are cited or papers are cited incorrectly).

**CITED REFERENCE INDEX**

References: 1 - 50 of 51

<table>
<thead>
<tr>
<th>Select</th>
<th>Cited Author</th>
<th>Cited Work</th>
<th>Year</th>
<th>Volume</th>
<th>Issue</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>Clark, C.W. Parks, SE</td>
<td>The urban whale: North Atlantic right whales at the crossroads. Title: Listening to their world; acoustics for monitoring and protecting right whales in an urbanized ocean.</td>
<td>2006</td>
<td>1</td>
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<td>✔️</td>
<td>Greaves, Harshnam S., Parks, Sophie E.</td>
<td>AGRICULTURAL WATER MANAGEMENT: Title: Water and nutrient use efficiency of a low-cost hydroponic greenhouse for cucumbers. An Australian case study.</td>
<td>2011</td>
<td>58</td>
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<td>Heigh, A.</td>
<td>A Guide to nutritional requirements of some Proteaceae</td>
<td>1997</td>
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<td>Parks, S.E.</td>
<td>Handbook of injury and violence prevention. Title: Cultural appropriateness in interventions for racial and ethnic minorities.</td>
<td>2007</td>
<td>1</td>
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<tr>
<td>✔️</td>
<td>Parks, Susan E.</td>
<td>The urban whale: North Atlantic right whales at the crossroads. Title: Acoustic communication: social sounds and the potential impacts of noise.</td>
<td>2007</td>
<td>1</td>
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<td>300</td>
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<tr>
<td>✔️</td>
<td>Parks, S.E.</td>
<td>Acoustic communication in the North Atlantic right whale (Eubalaena glacialis). Publisher: Massachusetts Institute of Technology &amp; Woods Hole Oceanographic Institute, USA.</td>
<td>2003</td>
<td>1</td>
<td>300</td>
<td>300</td>
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<td></td>
<td>PARKS, S.E.</td>
<td>AMERICAN JOURNAL OF SURGERY</td>
<td>1985</td>
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</table>

**Must always ‘Finish Search!’**
Citation Mapping in Web of Science
Visually Demonstrate Author/Article Influence
## Google Scholar Citations

### Patrick Williams

**Syracuse University**

**Information Studies - Digital Humanities - Online Learning - Digital Libraries - Information Literacy**

Verified email at syr.edu

### Citation Indices

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Since 2008</th>
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<tr>
<td>Citations</td>
<td>54</td>
<td>34</td>
</tr>
<tr>
<td>h-index</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>i10-index</td>
<td>1</td>
<td>1</td>
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</tbody>
</table>

### Citations to my articles

<table>
<thead>
<tr>
<th>Title / Author</th>
<th>Cited by</th>
<th>Year</th>
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<tbody>
<tr>
<td>Collection understanding</td>
<td>40</td>
<td>2004</td>
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<tr>
<td>Pedagogical design for an online information literacy course: College students' learning experience with multi-modal objects</td>
<td>7</td>
<td>2009</td>
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<tr>
<td>Use of multi-modal media and tools in an online information literacy course: College students' attitudes and perceptions</td>
<td>4</td>
<td>2009</td>
</tr>
<tr>
<td>Cost justification</td>
<td>3</td>
<td>2008</td>
</tr>
</tbody>
</table>

### Follow this author
- Follow new articles
- Follow new citations

### Co-authors
- No co-authors
Problem: author disambiguation

Joan V. Dannenhoffer
Syracuse University

John F. Dannenhoffer III
Syracuse University

Joanne M. Dannenhoffer
Central Michigan University

Joanne M. Dannenhoffer
M.D. May 2013

John F. Dannenhoffer
PhD Candidate, University

Databases see all of these people as:
J Dannenhoffer
JV Dannenhoffer
JF Dannenhoffer
JM Dannenhoffer
Solution: ORCID

“ORCID is an open, non-profit, community-based effort to create and maintain a registry of unique researcher identifiers and a transparent method of linking research activities and outputs to these identifiers.”

- http://orcid.org/
Altmetrics

- altmetrics is the creation and study of new metrics based on the social web for analyzing, and informing scholarship
Altmetric tools

• ImpactStory
• ReaderMeter
• ScienceCard
• PLoS Impact Explorer
• PaperCritic
• Crowdometer
Altmetric limitations

• New
• Time frame – some new tools cannot search old mentions, tweets, etc.
• Rely on user generated metadata
• Should social media mentions be given the same weight as scholarly article citations?
• Can these tools be easily manipulated to raise significance of an article?
ImpactStory

article

Mega-phylogeny approach for comparative biology: an alternative to supertree and supermatrix approaches
(2009) Smith, Beaulieu, Donoghue BMC Evol Biol

saved by scholars
16 bookmarks 153 readers

discussed by public
2 likes 2 tweets

What do these numbers mean?

cited by scholars
14 citations 52 citations

saved by public
1 bookmarks

recommended by scholars
Yes reviewed

Computational toxicology using the OpenTox application programming interface and Bioclipse.
(2011) Willighagen, Jeliszkova, Hardy et al. BMC research notes

Multistep correlations via covariance processing of COSY/GCOSY spectra: opportunities and artifacts

Pyramid symmetry transforms: From local to global symmetry
DUNCAN J WATTS

H₉-Index: 35
G₉-Index: 56

Most read publication: 167
Total number of publications: 138
Total bookmarks: 3561

Top 10 publications by readership:

3. Dodds et al. (2002)
4. Wu et al. (2011)
7. Watts et al. (2002)
8. Watts and Dodds (2007)
10. Watts (2001)

Duncan J Watts's coauthors

More on citation metrics

Citation Metrics

Citation analysis is a quantifiable measure of academic output and may help inform decisions on promotion and tenure. This guide is designed to help faculty members and librarians use and understand the tools available to them. We are fortunate to have access to the top paid resources used for citation metrics – Web of Science, Scopus and Journal Citation Reports.

We need to be aware of the limitations and inconsistencies of citation metrics. The databases referenced above, and including Google Scholar, do not correct errors in citing papers. This means that one paper may be cited many different ways and appear as separate entries in these tools. Also, author and institutional naming inconsistencies complicate these analyses.

Comparisons between these tools should be avoided. The databases use different sources to generate data and some are more comprehensive than others. In addition, the literature suggests that these tools are skewed towards the STM (science, technical and medical) community of scholars.

The recommended methods for citation analyses are detailed in this guide. Another useful metric is the h-index which can be generated in both Web of Science and Scopus. The h-index is defined as:

A scientist has index h if h of [his/her] Np papers have at least h citations each, and the other (Nh - h) papers have at most h citations each.

Information for Authors

ORCID

ORCID - Open Researcher ID - is an initiative to provide researchers and scholars with a persistent, unique identifier. This will enable

Comparison across Databases

Useful data can be found in each tool but direct comparisons across databases are problematic. These resources use different pools of data, date ranges and may interpret citations differently. Correct attribution of authorship can also cause reporting errors. Take control of your scholarly output - check your author profiles and register for an ORCID ID.

Subject Specialist

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Send Email

Links:
Profile & Guides
Subjects:
Biology, Chemistry, Forensic Science

Your Librarian
Questions?

http://researchguides.library.syr.edu/citationmetrics