

The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The text is centered in the middle of the slide.

METRICS: A QUICK INTRODUCTION

TUESDAY, OCTOBER 20, 2015

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WHY METRICS?

- QUANTIFIABLE MEASURES OF RESEARCH IMPACT
- DIFFERENTIATE ARTICLES, JOURNALS, AUTHORS, INSTITUTIONS
- IMPERFECT CALCULATIONS OF A FUZZY CONCEPT



HOW ARE METRICS USED?

- EVALUATE RESEARCHERS:

- HIRING
- TENURE/PROMOTION
- MERIT AWARDS
- GRANT FUNDING

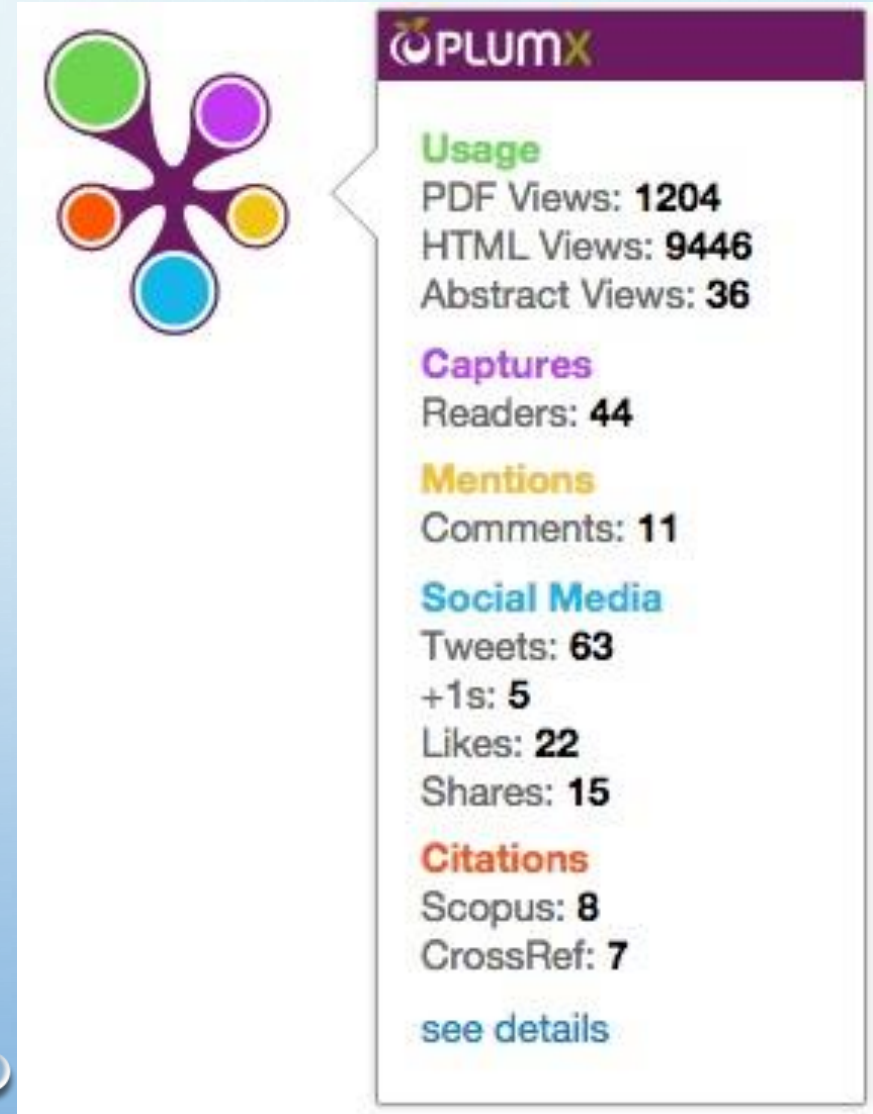
- b. Scholarship**

Faculty members' thorough understanding of and significant contribution to their field are essential to the mission of the university and to the advancement of knowledge. All teaching units or academic units must have criteria that require creative, scholarly, and professional achievements of the highest quality and with national or international **impact**. The university shall base its assessment of a faculty member's achievements on the aggregate productivity and impact of the work since degree completion, including evidence that the faculty member is productive at AU. The work should relate directly to the criteria established by the teaching unit or academic unit. An additional required assessment addresses the likelihood of continued successful achievements.

- BENCHMARK PROGRAMS AND INSTITUTIONS

WHAT ARE METRICS

- TRADITIONAL BIBLIOMETRICS
 - BASED ON CITATION COUNTS
- EMERGING ALTMETRICS
 - BASED ON ONLINE TOOLS



TRADITIONAL BIBLIOMETRICS FOR JOURNALS

- IN THE BEGINNING .. THERE WAS IMPACT FACTOR
- CREATED IN 1950S AS A TOOL FOR LIBRARIANS
- OWNED BY THOMSON REUTERS, PUBLISHED IN JOURNAL CITATION REPORTS

Journal Impact Factor ⓘ

Cites in 2010 to items published in: 2009 = 351	Number of items published in: 2009 = 45
2008 = 472	2008 = 49
Sum: 823	Sum: 94

Calculation: <u>Cites to recent items</u>	<u>823</u> = 8.755
Number of recent items	94

IMPACT FACTOR IN CONTEXT

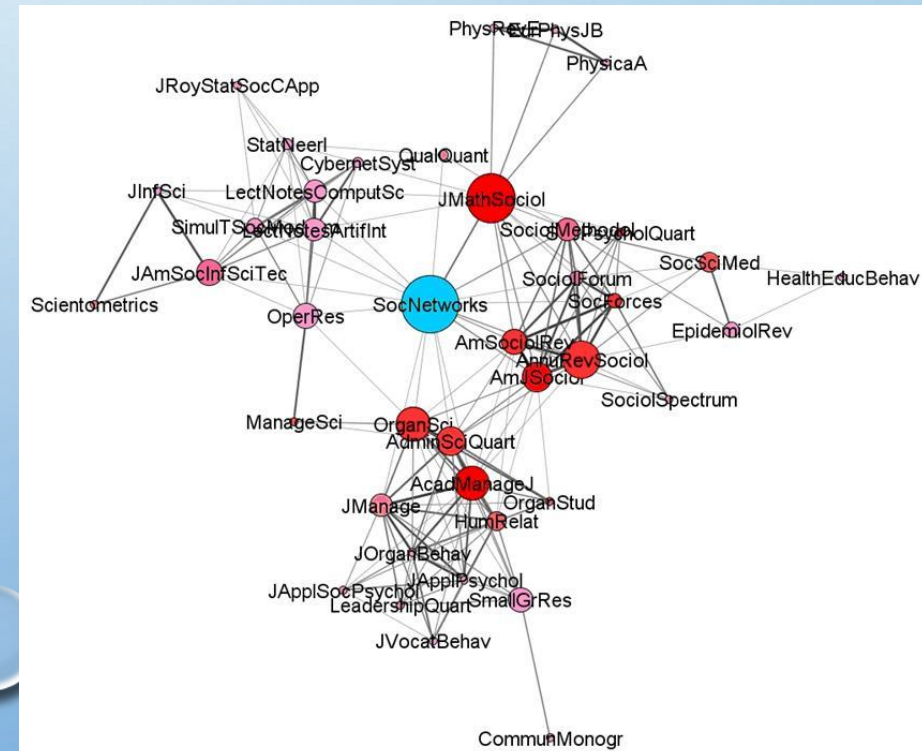
Select Category ✕

- PHYSICS, MULTIDISCIPLINARY
- PHYSICS, NUCLEAR
- PHYSICS, PARTICLES & FIELDS
- PHYSIOLOGY
- PLANNING & DEVELOPMENT
- PLANT SCIENCES
- POLITICAL SCIENCE
- POLYMER SCIENCE
- PRIMARY HEALTH CARE

	Full Journal Title	Total Cites	Journal Impact Factor ▼
1	POLITICAL ANALYSIS	1,934	4.655
2	AMERICAN POLITICAL SCIENCE REVIEW	9,680	3.688
3	JOURNAL OF PEACE RESEARCH	2,358	3.387
4	AMERICAN JOURNAL OF POLITICAL SCIENCE	7,753	3.269
5	Annual Review of Political Science	1,812	3.140
6	POLITICAL GEOGRAPHY	1,883	2.676
7	EUROPEAN JOURNAL OF POLITICAL RESEARCH	2,687	2.508
8	POLITICAL PSYCHOLOGY	1,972	2.384
9	JOURNAL OF POLITICS	4,654	2.255
10	GOVERNANCE-AN INTERNATIONAL JOURNAL OF POLICY ADMINISTRATION AND INSTITUTIONS	1,154	2.237

IMPACT FACTOR ALTERNATIVES

- SJR
 - BASED ON SCOPUS DATA
 - CREATED BY INDEPENDENT RESEARCH GROUP, SCIMAGO
 - FREELY AVAILABLE ON SCIMAGOJR.COM
- H5-INDEX
 - CREATED BY GOOGLE SCHOLAR
 - ALSO FREE THROUGH GOOGLE SCHOLAR METRICS



SJR AND H5-INDEX CATEGORIES

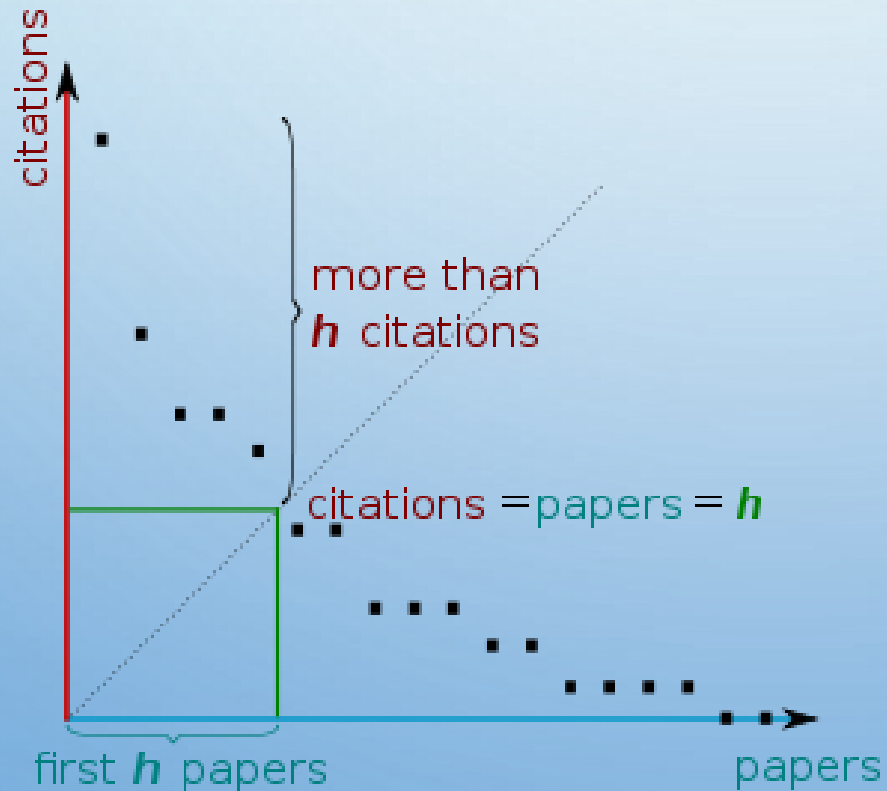
	Title	Type	SJR
1	International Organization	j	5,420
2	Living Reviews in European Governance	j	4,526
3	International Security	j	4,395
4	Journal of Conflict Resolution	j	4,263
5	Journal of Peace Research	j	3,800
6	Quarterly Journal of Political Science	j	3,703
7	World Politics	j	3,225
8	International Studies Quarterly	j	2,925
9	European Union Politics	j	2,704
10	Perspectives on Politics	j	2,330

Publication	h5-index
1. American Political Science Review	61
2. American Journal of Political Science	58
3. The Journal of Politics	44
4. JCMS: Journal of Common Market Studies	39
5. Comparative Political Studies	38
6. West European Politics	36
7. European Journal of Political Research	36
8. British Journal of Political Science	35
9. Journal of European Public Policy	35
10. Political Analysis	33

AUTHOR METRIC

- H-INDEX

- AVAILABLE THROUGH WEB OF SCIENCE, SCOPUS, AND GOOGLE SCHOLAR
- 'TRUE' H-INDEX MAY REQUIRE MORE EFFORT



MAJOR CRITICISMS WITH BIBLIOMETRICS

- CITATIONS MAY NOT MEASURE POSITIVE IMPACT
- CITATIONS BIAS FOR CERTAIN TYPES OF ARTICLES
- DISCIPLINARY APPLICATIONS
- CITATIONS BASED ON DATABASE OF INDEXED JOURNALS
- SUBJECT CATEGORIES OFTEN TOO BROAD
- MAJOR DECISIONS BASED ON LIMITED DATA POINTS

Scientometrics, Vol. 1, No. 4 (1979) 359–375

IS CITATION ANALYSIS A LEGITIMATE EVALUATION TOOL? *

E. GARFIELD

*Institute for Scientific Information® (ISI®), 325 Chestnut Street,
Philadelphia, PA 19106 (USA)*

ENTER ALTMETRICS

WHAT ARE ALTMETRICS?

- **DEFINITION:** THE CREATION AND STUDY OF NEW METRICS BASED ON THE SOCIAL WEB FOR ANALYZING AND INFORMING SCHOLARSHIP.

ALTMETRICS.ORG

- **MY DEFINITION:** THE UMBRELLA CLASSIFICATION OF NON-CITATION BASED METRICS.



The image shows a screenshot of a Twitter profile for Jason Priem (@jasonpriem). The profile picture shows a man wearing a hat. The bio reads: "Impactstory co-founder. Passionate about #altmetrics, #openscience, and bringing scholarly communication into the age of the web." The location is "Vancouver BC" and the website is "impactstory.org/jason". He joined in June 2008. The statistics show 5,611 tweets, 606 following, 4,076 followers, 748 favorites, and 1 list. A pinned tweet from September 29, 2010, says: "I like the term #articlelevelmetrics, but it fails to imply *diversity* of measures. Lately, I'm liking #altmetrics."

TWEETS	FOLLOWING	FOLLOWERS	FAVORITES	LISTS
5,611	606	4,076	748	1

Jason Priem
@jasonpriem FOLLOWS YOU

Impactstory co-founder. Passionate about #altmetrics, #openscience, and bringing scholarly communication into the age of the web.

Vancouver BC
impactstory.org/jason
Joined June 2008

Tweets Tweets & replies Photos & videos

Pinned Tweet
Jason Priem @jasonpriem · 29 Sep 2010
I like the term #articlelevelmetrics, but it fails to imply *diversity* of measures. Lately, I'm liking #altmetrics.

WHERE DO ALTMETRICS COME FROM?

amazon

facebook

GitHub



goodreads

ResearchGate
SCIENTIFIC NETWORK



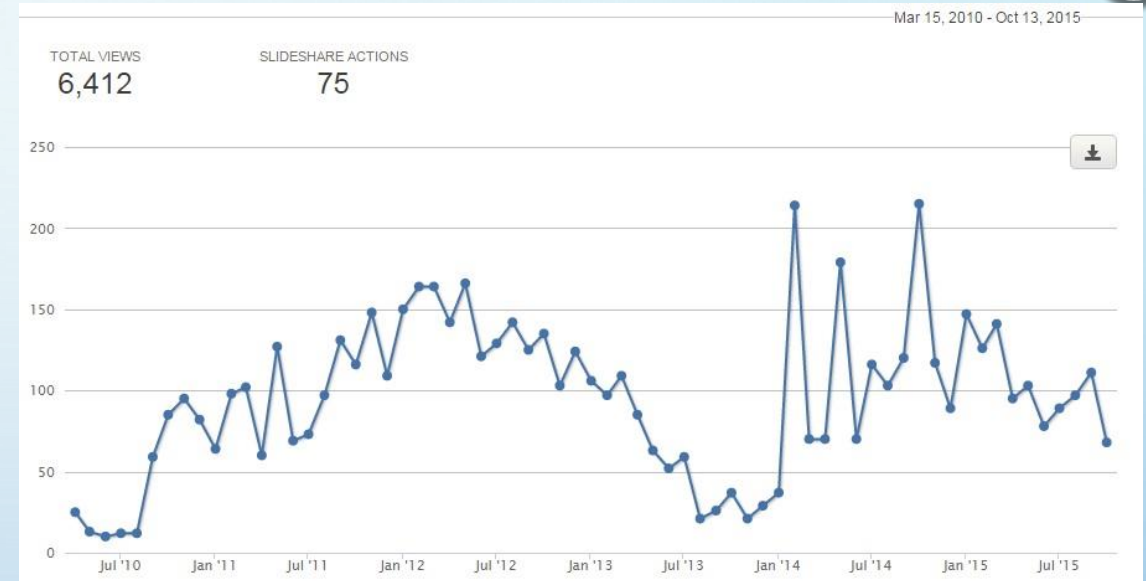
twitter



WIKIPEDIA
The Free Encyclopedia

HOW DO WE COLLECT ALTMETRICS?

- DIRECTLY FROM THE INDIVIDUAL TOOLS
- FROM PUBLISHERS (VIEWS, DOWNLOAD DATA)
- FROM (SOME) LIBRARY DATABASES
- FROM SCHOLARLY NETWORKS
- THROUGH AGGREGATING TOOLS



0 Saves	0 Citations
1,104 Views	152 Shares

Times Cited: 1
(from All Databases)

Last 180 Days: 113

Times Cited: 0
(from All Databases)

Last 180 Days: 80

5 PUBLICATIONS

111 Views 66 Downloads 13 Citations

Close x

107

- Blogged by 5
- Tweeted by 85
- On 7 Facebook pages
- Mentioned in 2 Google+ posts
- 55 readers on Mendeley
- 2 readers on CiteULike

[Click for more details](#)

HOW DO WE CATEGORIZE ALTMETRICS?

- NO STANDARD CATEGORIES

- ONE TOOL'S CATEGORIES:

- VIEWED
- CITED
- DISCUSSED
- SAVED
- RECOMMENDED

- ANOTHER TOOL SEPARATES PUBLIC AND SCHOLARLY ENGAGEMENT

Highly discussed by **the public**

This product has 28 Twitter tweets.
That's more than 97% of 2012
Biological Sciences articles on
Impactstory. Click for details.

MAJOR ALTMETRICS TOOLS

- ALL GATHER METRICS AND PROVIDE CONTEXT FOR RAW DATA
- ALTMETRIC
 - BADGE/DONUT
 - EXPLORER
 - FOR INSTITUTIONS
- IMPACTSTORY
 - SUBSCRIPTION FOR AUTHORS
 - ONLINE CV SUPPLEMENT
- PLUMX
 - INSTITUTIONAL SUBSCRIPTION



ALTMETRIC

Altmetric for Scopus



Blogs Twitter Facebook Google+ **Score** Demographics

The Altmetric score is one measure of the quality and quantity of online attention that this article has received. You can read about [how Altmetric scores are calculated](#) here.

This article scored **243.36**

The context below was calculated when this article was last mentioned on **28th May 2014**

Score in context

Puts article in the top 5% of all articles ranked by attention

[show more...](#)

Mentioned by

12 blogs
270 tweeters
9 Facebook users
13 Google+ users

Readers on

198 Mendeley
23 CiteULike
0 Connotea

Actions

[Open report in new tab](#)
[Fetch as JSON](#)



[Close x](#)

Blogged by 5
Tweeted by 85
On 7 Facebook pages
Mentioned in 2 Google+ posts
55 readers on Mendeley
2 readers on CiteULike
[Click for more details](#)

Compared to all articles in Nature

So far Altmetric has tracked 27,727 articles from this journal. They typically receive a lot more attention than average, with a mean score of 43.7 vs the global average of 5.0. This article **has done particularly well**, scoring higher than 96% of its peers.

In the
96%ile

Ranks
995th

All articles of a similar age

Older articles will score higher simply because they've had more time to accumulate mentions. To account for age we can compare this score to the 276,133 tracked articles that were published within six weeks on either side of this one in any journal. This article has done particularly well, scoring **higher than 99% of its contemporaries**.

In the
99%ile

Ranks
401st

Other articles of a similar age in Nature

We're also able to compare this article to 961 articles from the same journal and published within six weeks on either side of this one. This article **has done very well**, scoring higher than 93% of its contemporaries.

In the
93%ile

Ranks
59th



Theoretical Ecologist. Bio at: <http://carlboettiger.info>

Open Access



- Overview
- Map
- articles (16)
- datasets (23)
- figures (1)
- posters (3)
- slide decks (16)
- software products (49)
- unknowns (9)

Selected works

Is your phylogeny informative? Measuring the power of comparative methods.
(2012) Boettiger, Coop, Ralph. *Evolution*
[read fulltext](#)

[highly cited](#) [highly saved](#) [highly discussed](#) [highly viewed](#) +152 [saved](#)

rfishbase: exploring, manipulating and visualizing FishBase data from R.
(2012) Boettiger, Lang, Wainwright. *Journal of fish biology*
[read fulltext](#)

[highly saved](#) [highly discussed](#) [highly viewed](#) +56 [cited](#) [saved](#)

Tipping points: From patterns to predictions.
(2013) Boettiger, Hastings. *Nature*
[read fulltext](#)

[highly cited](#) [highly discussed](#) [highly viewed](#) +38 [saved](#)

Lab Notebook, 2012
(2013) *figshare*.

[highly discussed](#) [highly viewed](#) +11 [highly discussed](#) +199

[highly viewed](#) +69 [saved](#) +1

Key profile metrics

1.4M impressions on 16 articles

773 saves on 16 articles

99.4k impressions on 23 datasets

33.2k impressions on 16 slide decks

93 forks on 49 software products

IMPACTSTORY

Summary Full text Metrics (5) Map (27) Tweets (30)

87 Mendeley

Compared to other Biological Sciences articles from 2012. Click to read more about how we determine percentiles.

93rd percentile on Impactstory

218 Impactstory views

99th percentile on Impactstory

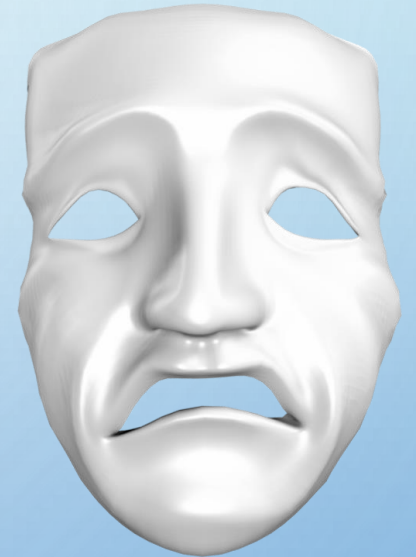
SOME BENEFITS OF ALTMETRICS

- NEW, COMPLEMENTARY WAYS TO ASSESS/MEASURE
- METRICS FOR RECENT PUBLICATIONS
- MEASURE OF PUBLIC ENGAGEMENT
- ASSESSMENT OF DIFFERENT TYPES OF SCHOLARSHIP



SOME LIMITATIONS OF ALTMETRICS

- IS THIS IMPACT? IS IT ATTENTION, ENGAGEMENT, OR SOMETHING ELSE?
- HOW DO WE AVOID 'GAMING'?
- DISCIPLINARY DIFFERENCES IN ONLINE USE/ENGAGEMENT
- SOURCES NEED TO BE TRACKED CONSISTENTLY



WHAT'S HAPPENING NOW IN ALTMETRICS

- NISO ALTMETRICS WORKING GROUPS
- ALTMETRICS RESEARCH
- CURRENT USAGE



NISO WORKING GROUPS

- DEFINITION AND CASE USES
 - RESEARCH ASSESSMENT
 - SHOWCASE ACHIEVEMENTS
 - DISCOVERY
- DATA STANDARDIZATION
- METHODOLOGY STANDARDIZATION



ALTMETRICS RESEARCH

- DISCIPLINARY DIFFERENCES
- CORRELATIONS BETWEEN METRICS CATEGORIES AND CITATIONS

A heatmap illustrating the correlations between various altmetrics categories and citations. The categories are listed on both the x-axis and y-axis. The color scale ranges from light blue (0.0) to dark blue (1.0), with white representing 0.0 and light grey representing -0.1. The diagonal elements are all 1.0.

plos-hosted comments	0.0	0.2	0.3	0.3	0.5	1.0
pageviews and shares	0.0	0.2	0.7	0.7	1.0	0.5
facebook-hosted discussion	-0.1	0.0	0.3	1.0	0.7	0.3
social ref saves	0.5	0.5	1.0	0.3	0.7	0.3
citations	0.6	1.0	0.5	0.0	0.2	0.2
pdf downloads	1.0	0.6	0.5	-0.1	0.0	0.0
	pdf downloads	citations	social ref saves	facebook-hosted discussion	pageviews and shares	plos-hosted comments

CURRENT USAGE

- NIH 'BROADER IMPACT' REQUEST FOR GRANT FUNDERS
- PROMOTION, TENURE
- SELF-DISCOVERY OF SOCIAL/SOCIETAL IMPACT



National Science Foundation
WHERE DISCOVERIES BEGIN

The background is a light blue gradient with several realistic water droplets of various sizes scattered in the corners. The droplets have highlights and shadows, giving them a three-dimensional appearance.

THANK YOU!

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