Does Data Sharing Influence Data Reuse in Biodiversity? A Citation Analysis.

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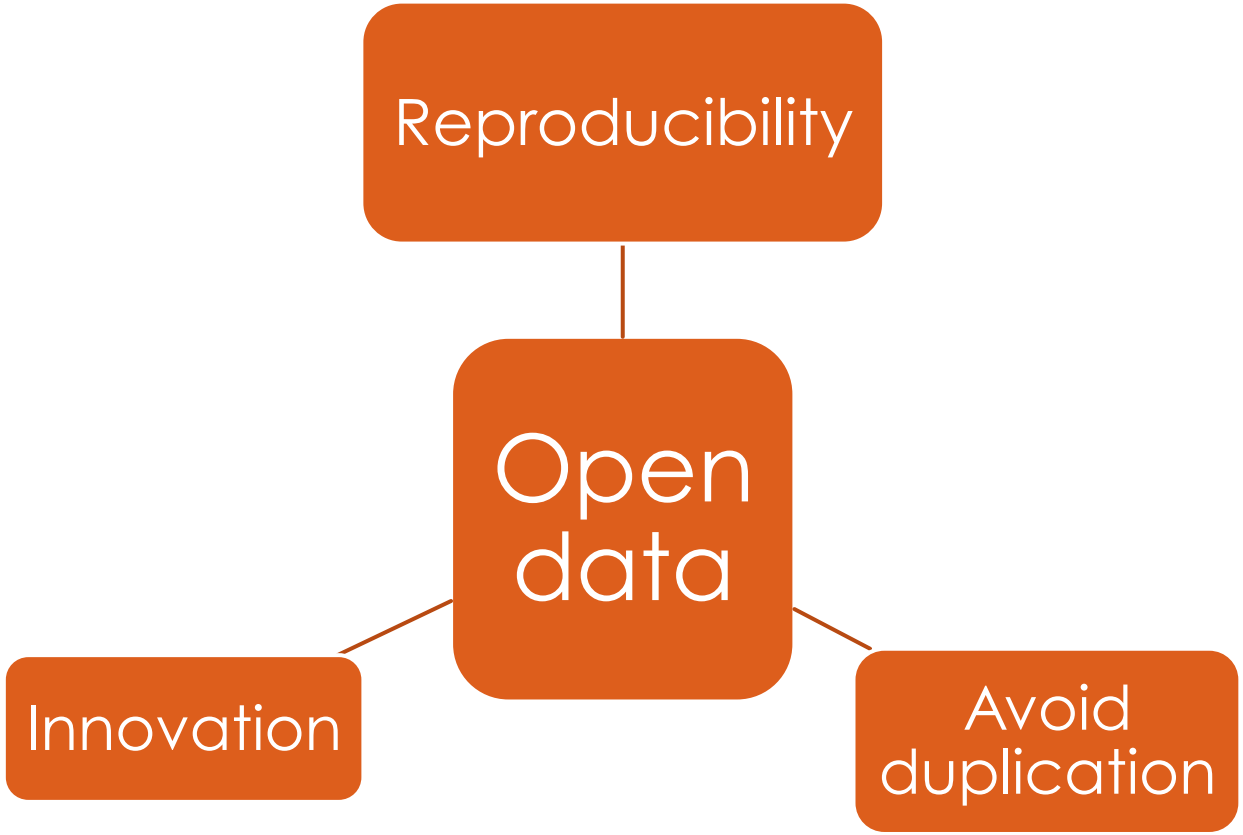
Open research data movement



Why share research data?

In 2013, the Office of Science and Technology declared that most funding agencies will require policies on sharing open research data.

- Promote reproducibility, innovation and new data uses
- New collaborations between data creators and data users
- Avoid duplication of spending research fund to collect the same data
- Improvement and validation of research methods
- Increase the impact and visibility of research

UK Data Service – Why Share Data? https://www.ukdataservice.ac.uk/manage-data/plan/why-share

Motivations for data sharing

Researchers want to know how their data has been reused [1]

How do we measure impact?

1. Kratz, J. E., & Strasser, C. (2015). Making data count. Scientific data, 2.

How do we define a dataset?

What is a dataset?

- Can be a file or multiple files
- Packaged with adequate metadata and documentation so that it can be reused by others.
- Has proper licensing to make it clear how the data can be accessed and used by others.

How do we define a dataset? (cont'd)

Here is the dilemma …

- Type of data and data sharing practice differ depending on fields
- Not all fields have similar culture and rate of data reuse
- Not all repositories for different types of data provide the same metrics to assess impact

Impact categories

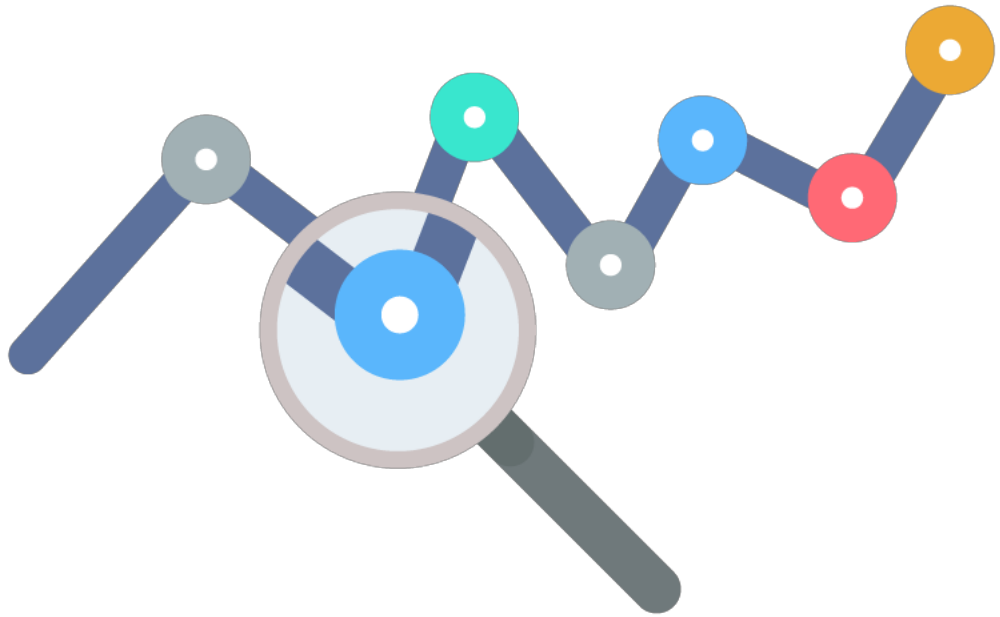
Fear, K (2013) on measuring impact for social science datasets -

- Data reuse
- Quality of publications that reuse data
- Diversity of publications that reuse data
- Size of network stemming from a single dataset
- Number of unique individuals who download a dataset

Konkiel, S. (2013). Tracking citations and altmetrics for research data: Challenges and opportunities. Bulletin of the American Society for Information Science and Technology, 39(6), 27-32.

Tracking reuse

- Data citation
- Altmetrics content
- Download counts
- ?



Case of Biodiversity data

- Global Biodiversity Information Facility (GBIF) was used as the data source
- Total number of datasets (May 14, 2018) – 38,878
- Dataset types – Occurrence, Checklist, Metadata-only, Sampling-event
- Metadata fields – number of citations, DOI, type, title, description, language, date created, date modified
- Additionally download counts were manually collected and citation counts were updated for the random sample (October 25, 2018).

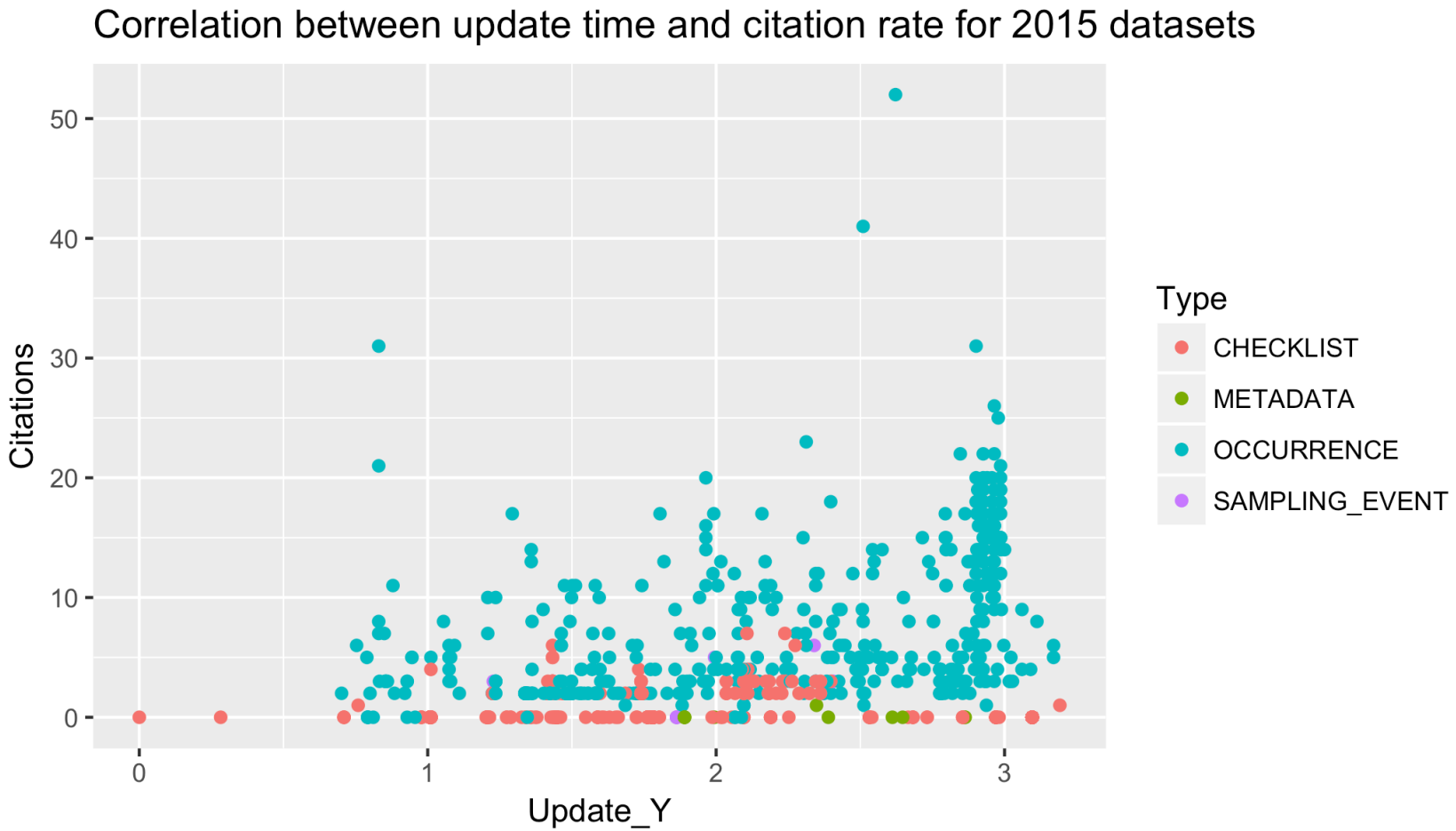
Research Questions

- Does the type of dataset or quality of information available affect citation rate?
- If a dataset is more recently updated (with the assumption that it is more frequently updated), does it have higher chance of being cited?
- How quickly dataset citations accrue?
- Does the citation count system in biodiversity result from coherent citation practice?
- Can we identify trending topics in biodiversity from the dataset types?

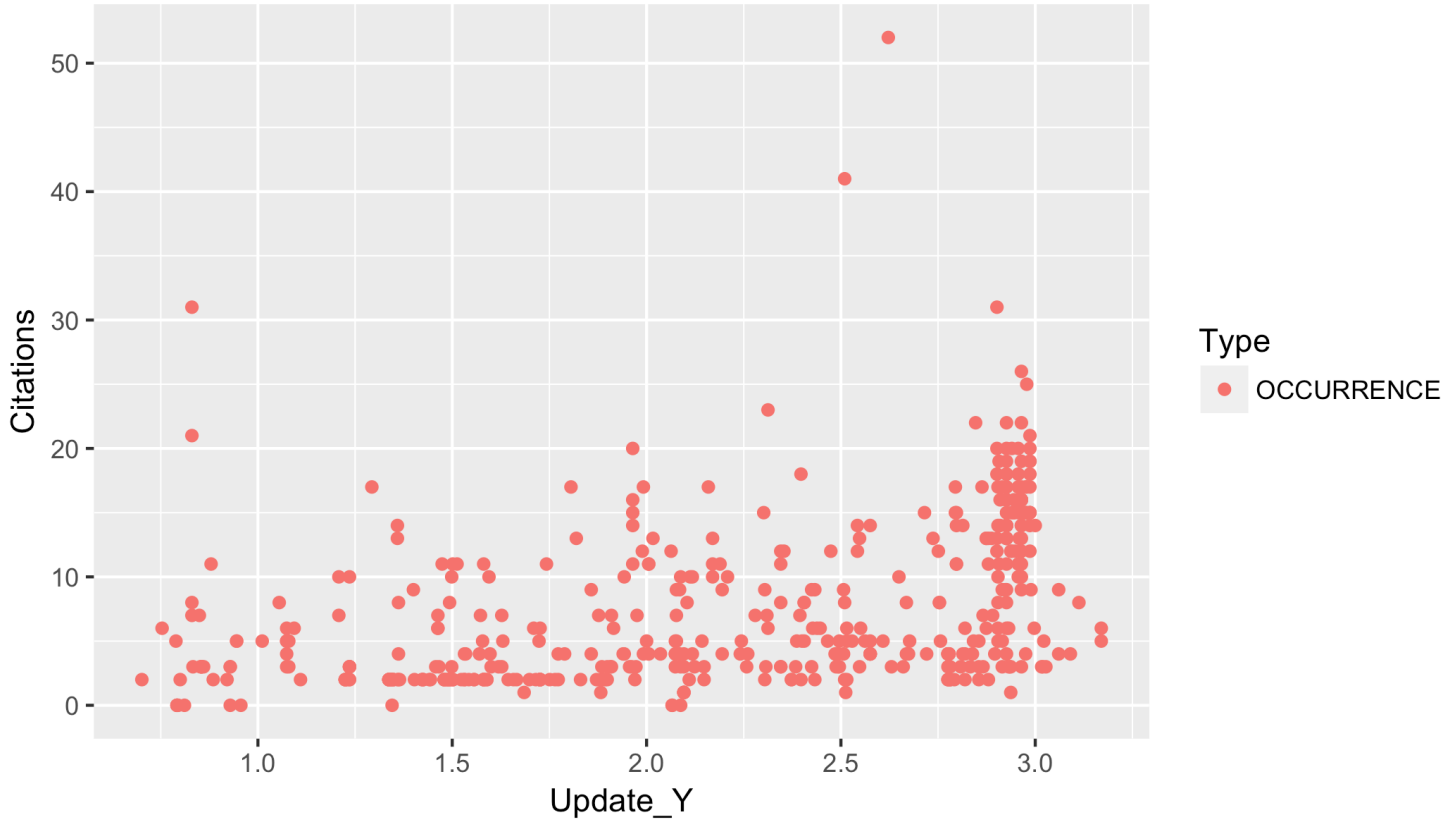
Citation distribution

Type	Number of datasets	Average citations
Occurrence	14956	4.2967371
Checklist	23549	0.2082042
Metadata-only	204	0.1078431
Sampling-event	169	1.4023669

Update frequency and citation rate of different datasets



Correlation test

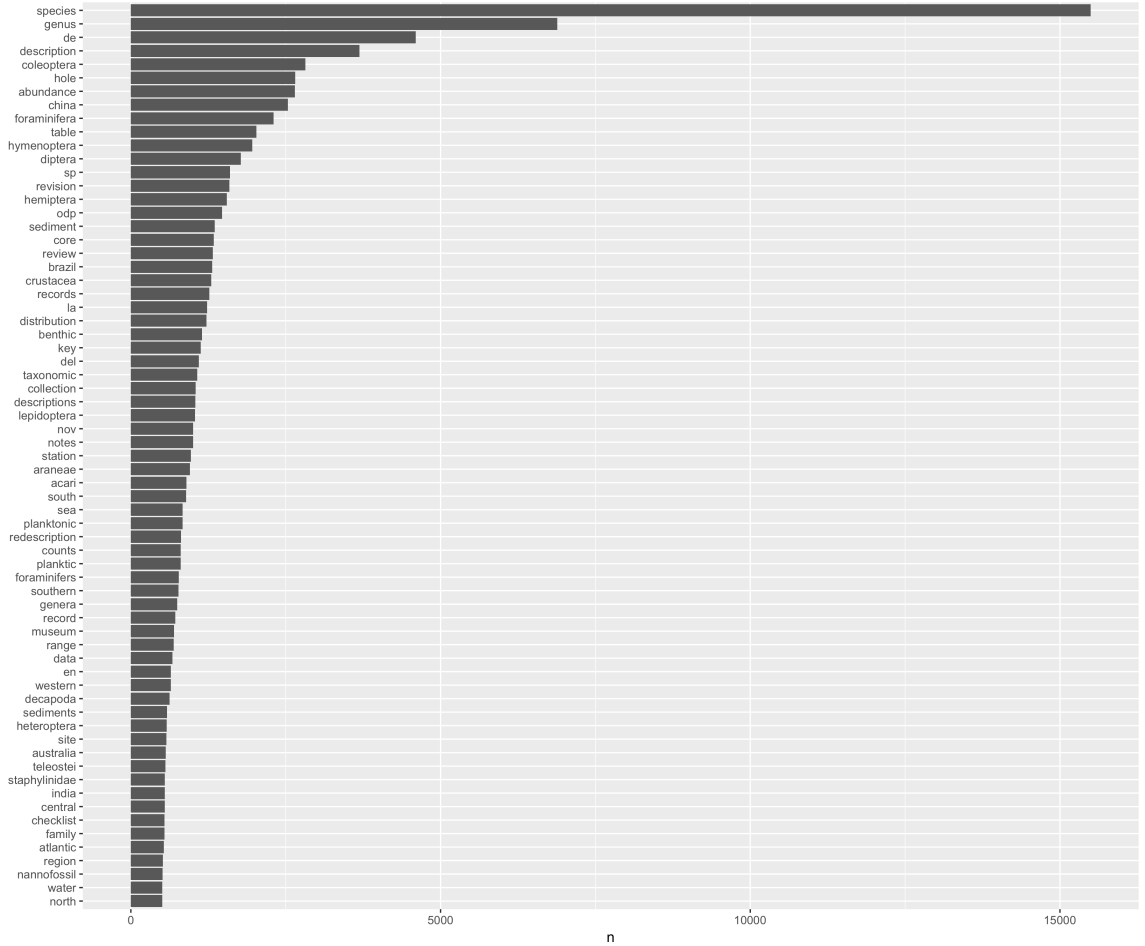


Correlation between dataset update time and citation rate; example of datasets published in 2015

Spearman's rank correlation rho

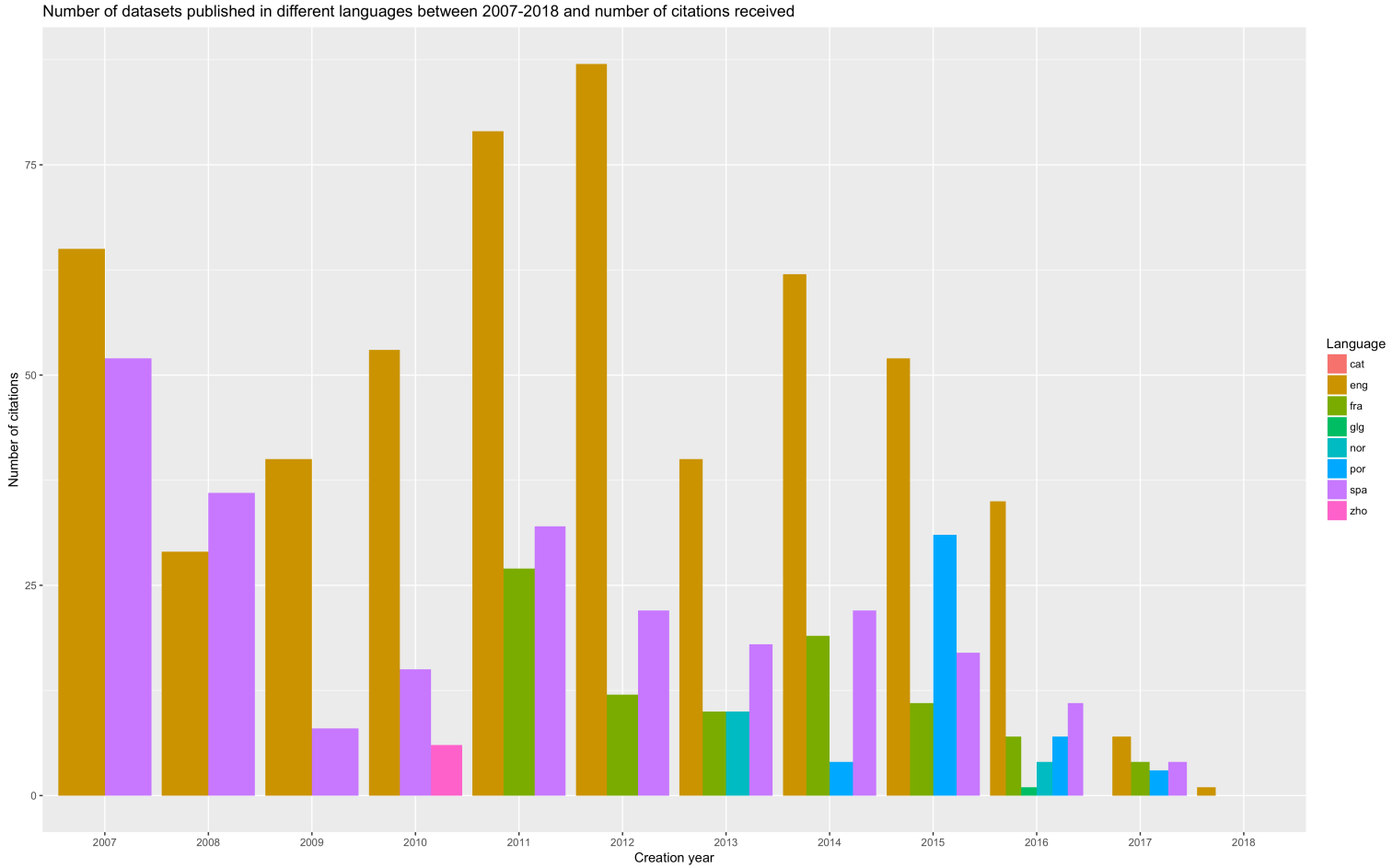
S = 8443200, **p-value** < 2.2e-16
alternative hypothesis: true rho is not equal to 0
sample estimates:
rho
0.5390476

Analysis of title texts



Some regions, including China, Brazil, Atlantic, Australia and India, appear more frequently than others

Language and citation distribution



Number of datasets published in different languages between 2007-2018 and number of citations received

Content analysis (work in progress)

- Random sample of 1000 out of 38,878 datasets
  - 438 datasets (43.8%) had at least one citation
- Collected download counts and updated citation counts to observe changes in past 6 months since initial data collection
- For datasets that received citations, selected one citing article randomly using random number generator
  - For each article (or book) collected DOI, citation location, data reuse case. (data for 100 cited datasets)

Content analysis results (work in progress)

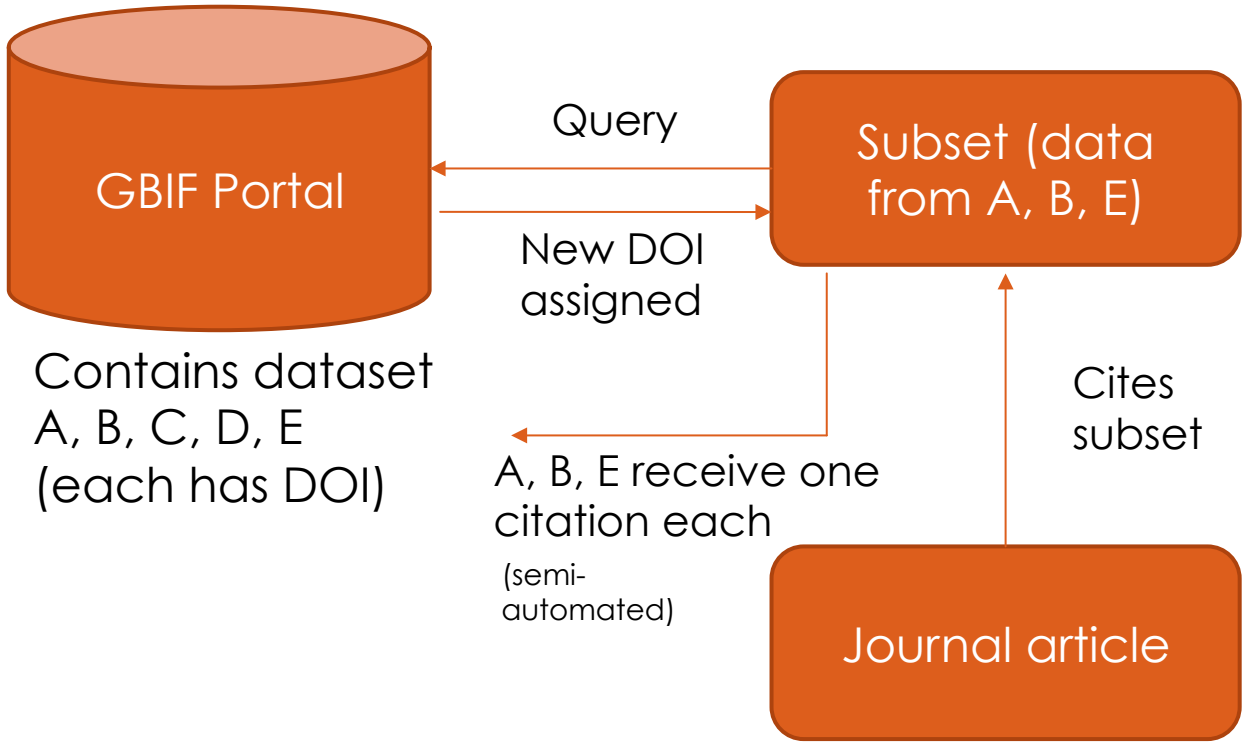
- Many datasets had accumulated citations over last 6 months
- 5 out of 100 datasets had high increase in citation (example: from 4 to 27)
- 25 out of 100 datasets had less citation than the initial record
- Almost all data reuse cases use multiple subsets of data
- Most of the times datasets are mentioned in methods and in some cases reference.

Technical requirement

Are we technically equipped to handle data citation count?

Why data citation count cannot always be the same as other citation counts?

How GBIF citation count works



How GBIF citation count works

Citation example of GBIF subset download –

Global Biodiversity Information Facility (GBIF). 2017b.
GBIF Occurrence Download. (accessed 20 December 2017).
https://doi.org/10.15468/dl.qpjjdk

Non-descriptive of the content

In case of reuse in multiple studies, doesn't indicate the original study

Total citation count for the original datasets don't reflect on regular databases

Recommendations

D

Define

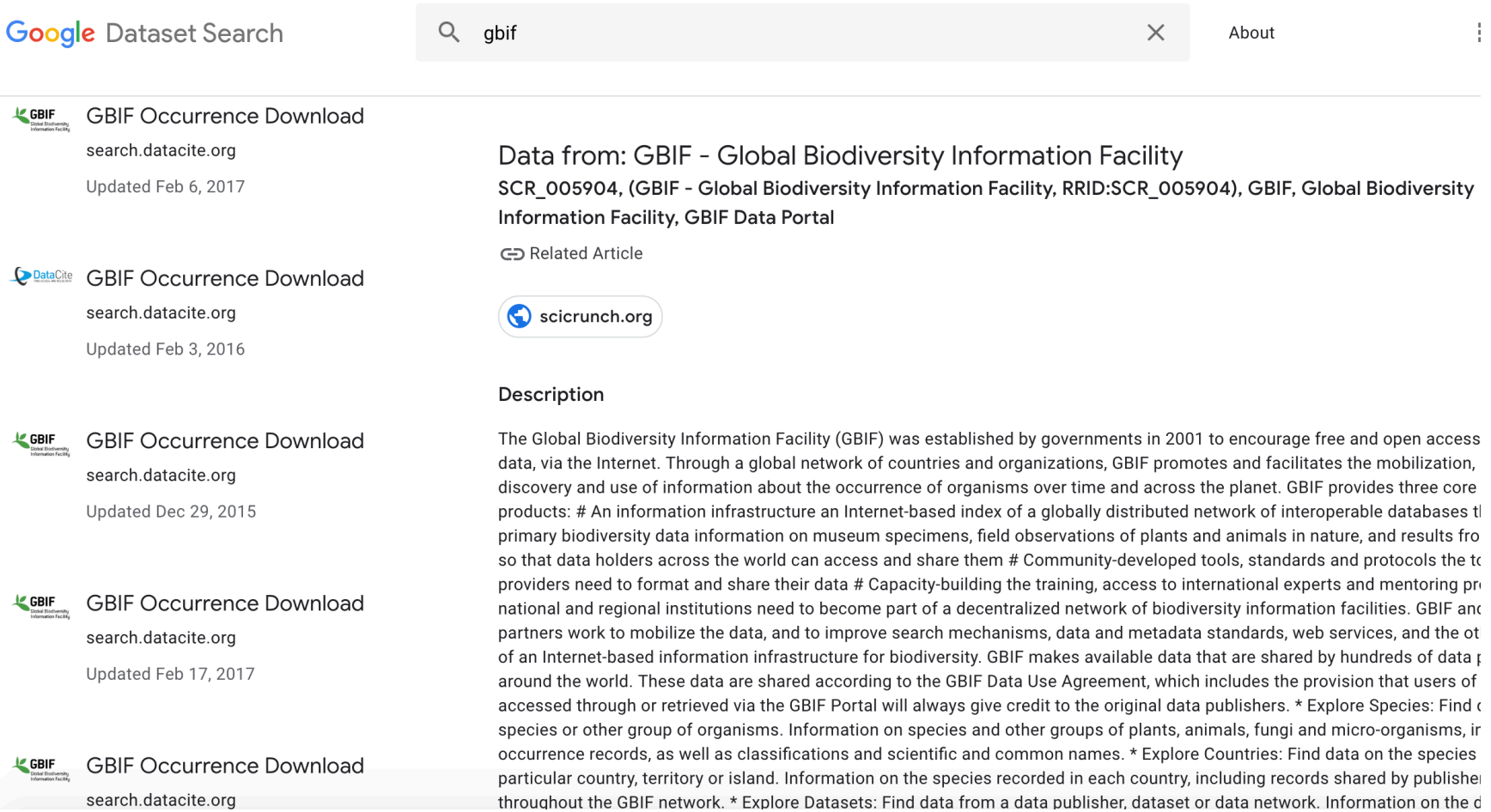
N

Normalize

D

Develop

Google Dataset Search



Tack!

Let's keep promoting (useful and curated) open research data!

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