

# A Bibliometrics Analysis of GMD Publications, 2010-2018

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## Introduction

Bibliometrics – the quantitative analysis of publication and citation data – is an evolving field that is gaining attention among administrators as a means of measuring scientific value and impact. When used in conjunction with qualitative measures such as peer review, bibliometrics is a useful tool for evaluating research.

Bibliometrics assumes that citation counts are a reasonable proxy for research quality. While quality is a complex notion that cannot easily be quantified, a substantial body of research has shown a weak to strong correlation between citation data and peer review(1,2).

The Boulder Labs Library analysis of 712 peer-reviewed publications authored by NOAA's Global Monitoring Division demonstrates that GMD's research has a significant influence not only in the scientific community, but also in many areas of human life and society.

## References

1. Aksnes, D.W., et al. 2019. Citations, citation indicators, and research quality: An overview of basic concepts and theories. *SAGE Open*, 9(1), doi.org/10.1177/2158244019829575.
2. Van Raan, A.F.J. 2006. Comparison of the Hirsch-index with standard bibliometric indicators and with peer judgment for 147 chemistry research groups. *Scientometrics* 67:491-502.
3. Clarivate Analytics. 2018. Incites Indicators Handbook, https://help.incites.clarivate.com.

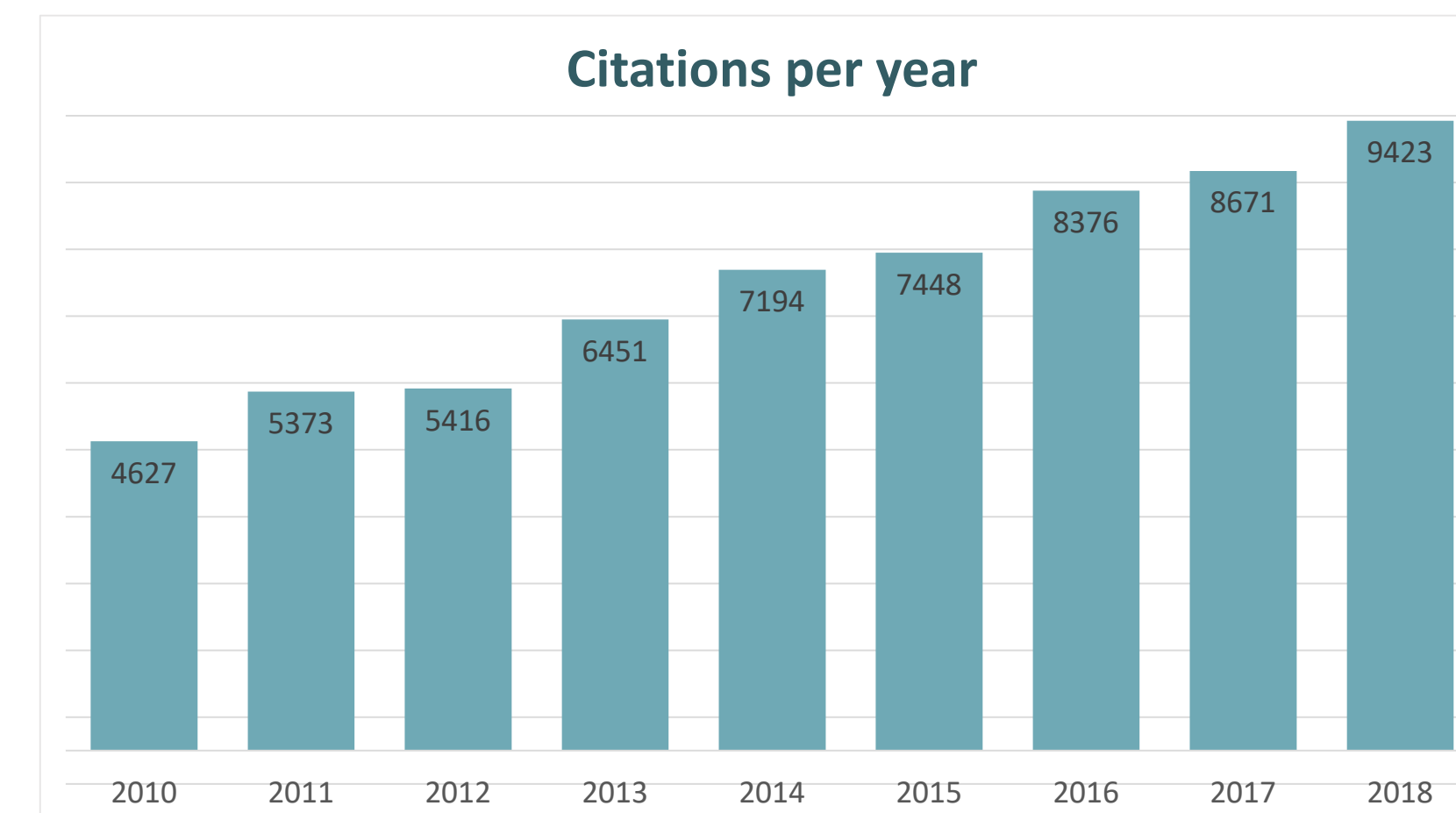
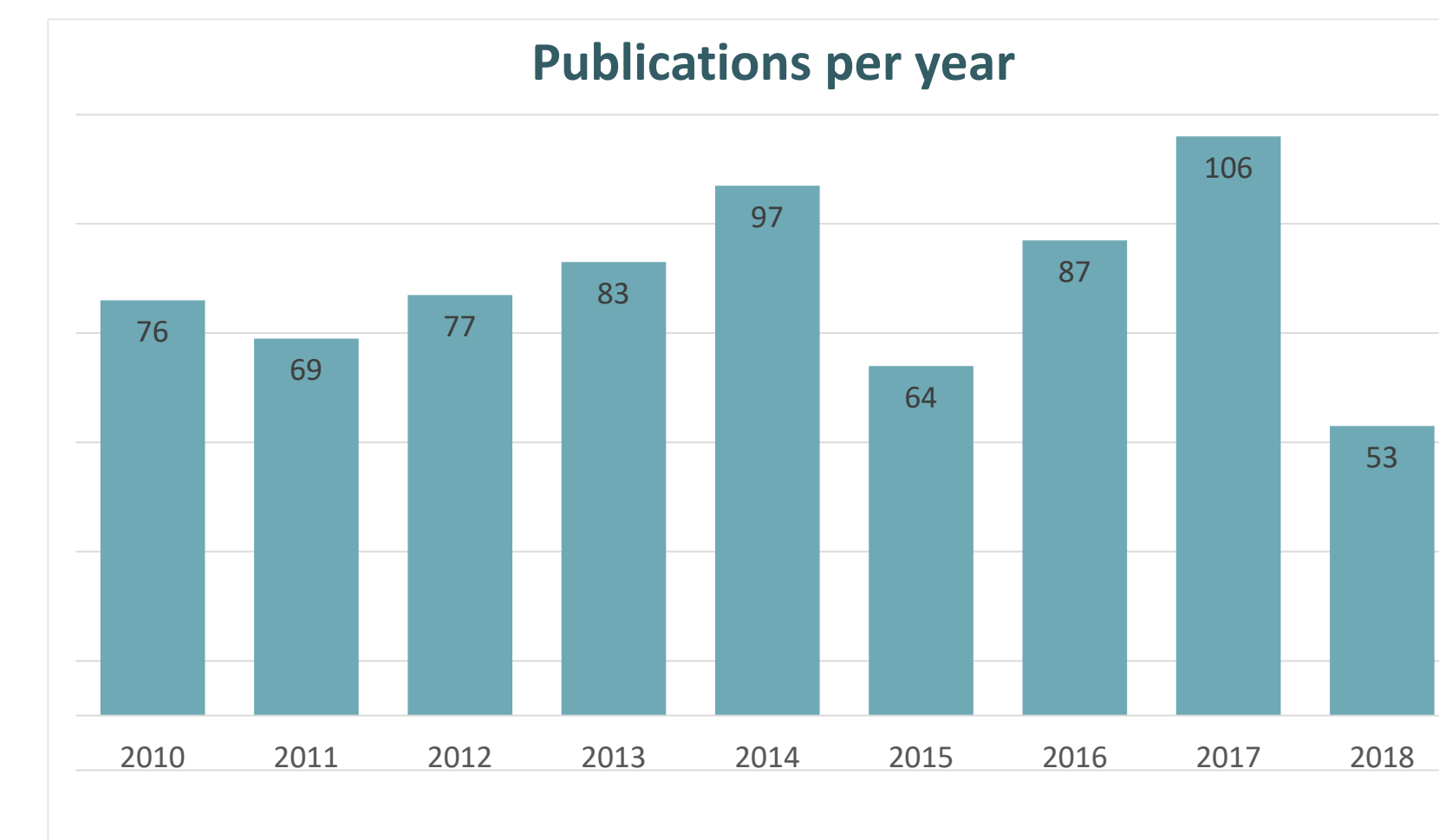
### About the Boulder Labs Library

The Boulder Labs Library supports the scientific research missions of NIST, NOAA, and NTIA in Boulder, by providing a robust collection of electronic and print resources as well as expert research services. Learn more at <https://library.blrdoc.gov/>.

## Standard Indicators

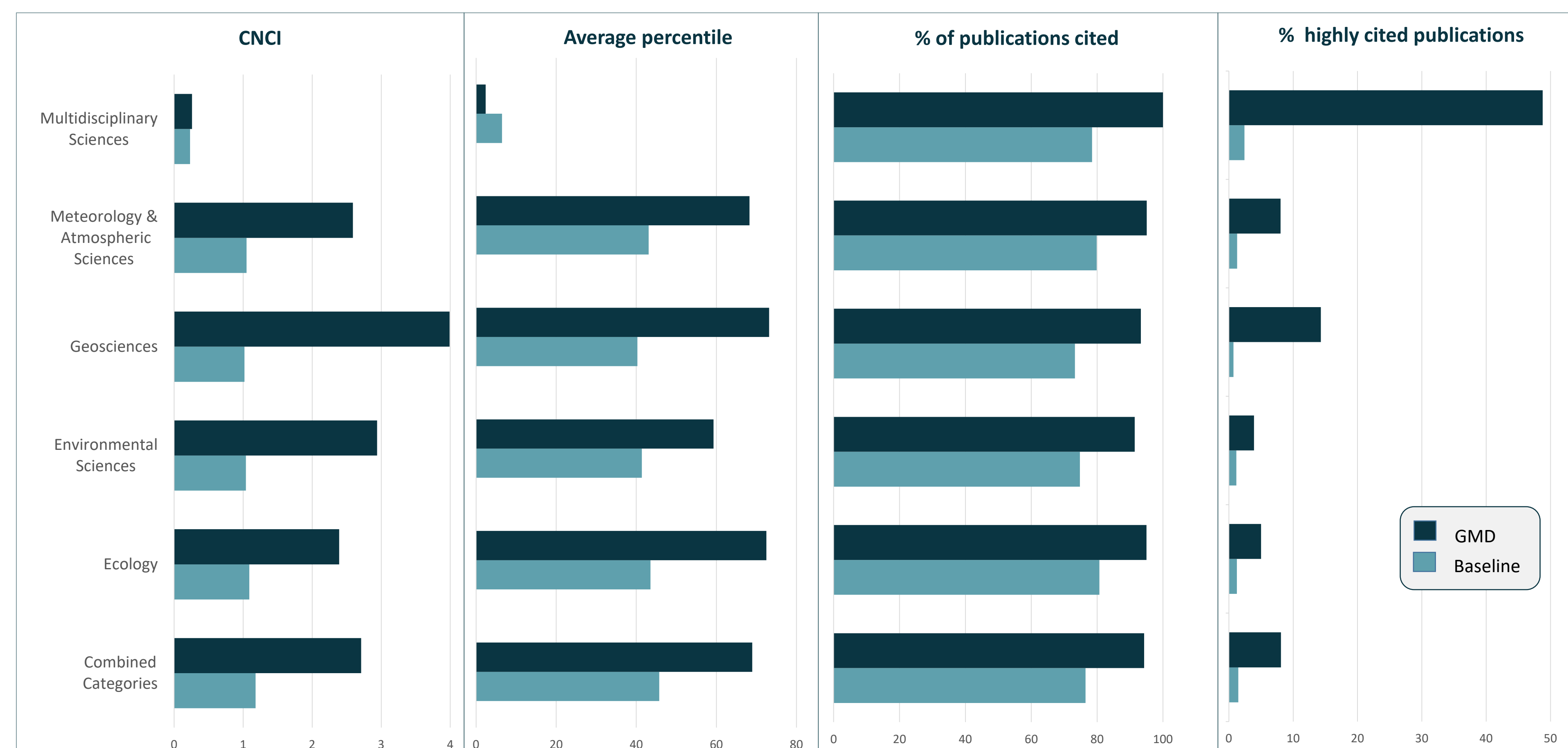
Summary Metrics	
Total number of publications	712
Average citations per publication	36
Group h-index	76
Total times cited / minus self-citations	25,649 / 22,941
Total number of citing publications / minus self citations	14,175 / 13,613

Standard indicators of productivity. Note that due to lag times in reporting and indexing, 2018 data are preliminary and likely not indicative of the total number of publications and citations for that year. **Citations per year** includes citations to **all GMD publications**, published from 1972-2018.



## Evaluative Indicators

Standard productivity indicators measure research output, but they lack context. Evaluative indicators help us understand how GMD's metrics compare to other research groups in the same discipline. Baseline metrics are derived from the average citation performance of all papers in the same research category, for the same time period. In nearly all categories and metrics, **GMD's performance significantly exceeds the baseline**.

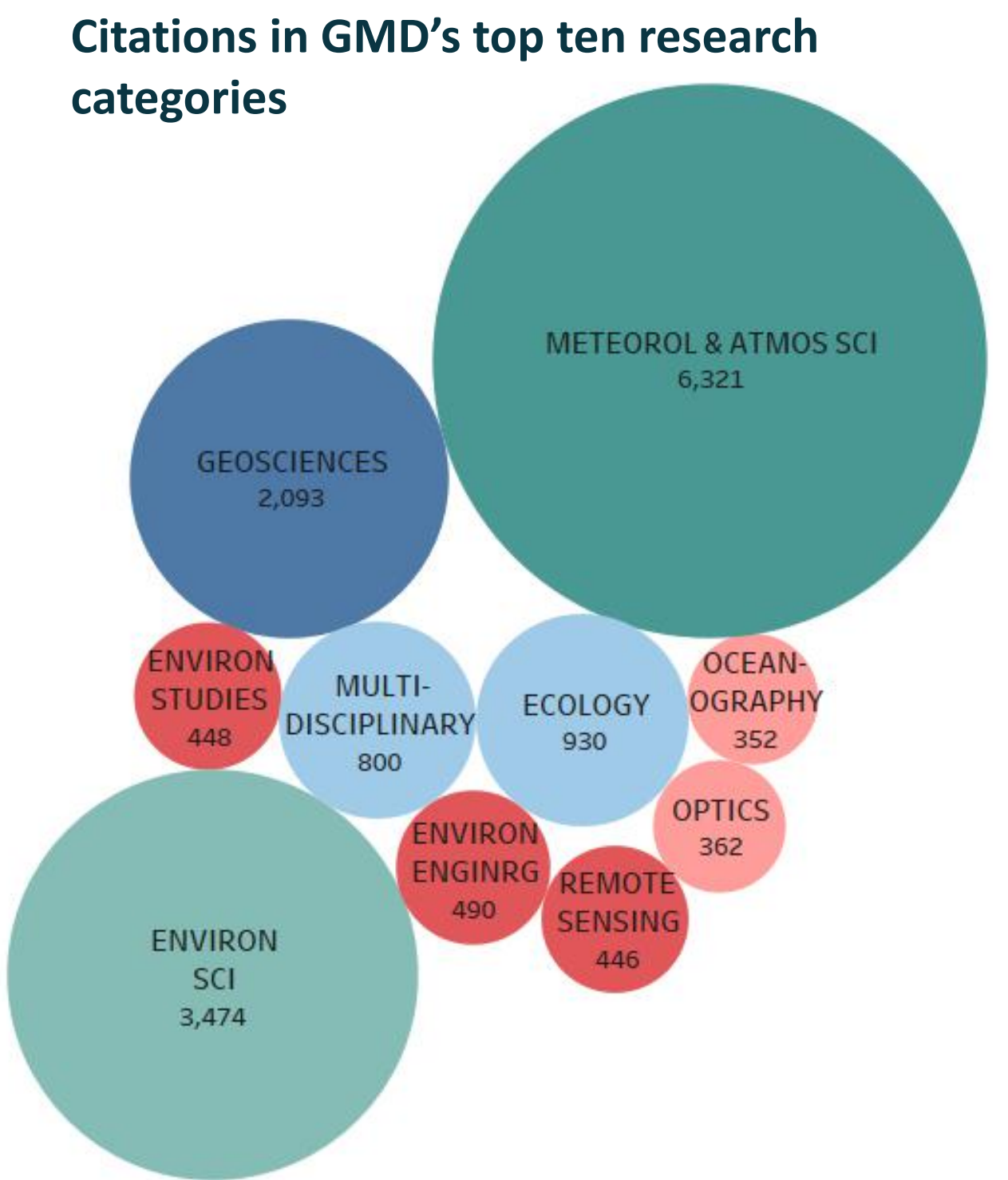


- **Category normalized citation index (CNCI)** is calculated by dividing the actual count of citing items by the expected citation rate. A CNCI value of 1 indicates a performance at par with the world average; a value above 1 indicates a performance above average.
- **Average percentile** is determined by creating a citation frequency distribution in a set of publications and determining the percentage of papers at each level of citation.
- **Highly cited** publications are those in the top 10% by citation rate(3).
- The **baseline** for each metric represents the average for all publications in the same category and time period.

## Interdisciplinary Impact

Citations to GMD research are plentiful in the expected scientific categories, but also appear in a wide range of disciplines such as:

- **public health** (*Environmental variables associated with vacationers' sun protection ...*, 2016)
- **hospitality & tourism** (*Communicating sustainability priorities in the museum sector*, 2015)
- **law** (*Remedying regulatory diseconomies of scale*, 2014)
- **food industry** (*Monitoring gas-phase CO2 in the headspace of champagne glasses...*, 2018)
- **political science** (*Climate science and slow violence: A view from political geography...*, 2016).



## Snapshot

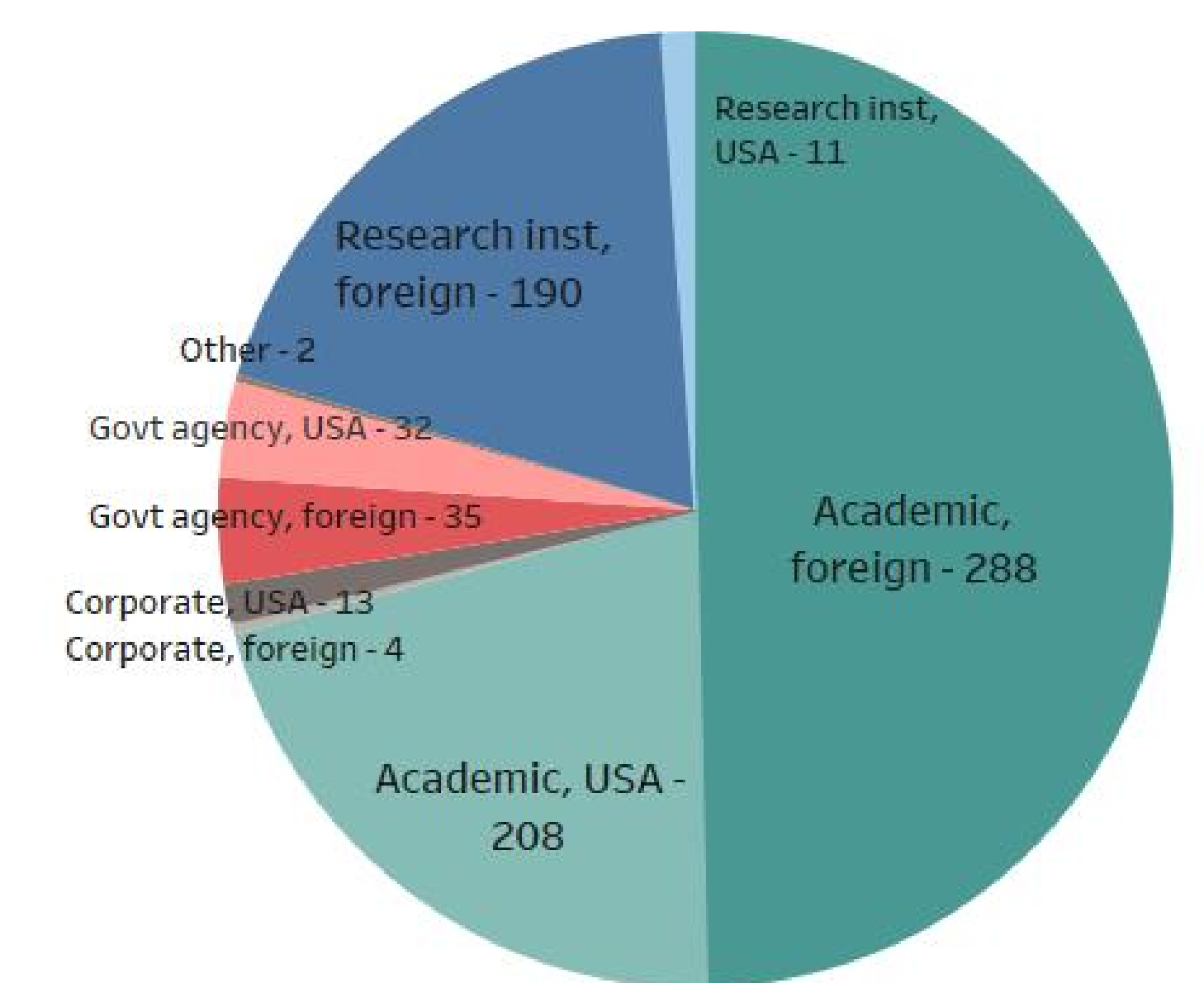
GMD's highest-cited paper is **Climate forcing by anthropogenic aerosols** (Charlson, R.J., et al., 1992, *Science* 255:423-430), with 2,379 citations as of April, 2019.

Since publication, this paper has been cited:

- an average of 98 times per year
- by authors in 85 countries
- in over 400 journals.

It has been mentioned in reports and policy documents by organizations such as the National Research Council, the IPCC, and the European Union, as well as textbooks, dissertations, and encyclopedias.

Types of citing organizations



This close look at just one of GMD's publications clearly shows the far-reaching impact of this important research.

For more information on bibliometrics, and for details on methodology and data sources for this poster, please visit: <https://library.blrdoc.gov/services/bibliometrics/>.

