# A Bibliometric Analysis of NOAA Climate Program Office Publications: FY2017-2021

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## About This Report

This report presents a summary-level bibliometric analysis of the known peer-reviewed journal articles produced as a result of ocean exploration missions supported by NOAA's Climate Program Office (CPO). This report was produced using data retrieved from the Web of Science, Science Citation Index Expanded and Social Science Index database and InCites on December 20, 2021, covering articles published from fiscal years 2017 thru 2021 (October 2016 – September 2021).

The bibliometric indicators presented in this report are based on citations from the select group of peer-reviewed journal articles indexed by Web of Science and, as such, do not reflect CPO articles from peer-reviewed journals not indexed by Web of Science (WoS) or from other sources such as book chapters, conference proceedings, or technical reports. The articles analyzed in this report were derived from lists provided by CPO.

More information about the methodology used and a full listing of all of the articles evaluated in this report are available upon request to <u>Sarah.Davis@noaa.gov</u>.

## PRODUCTIVITY

General productivity metrics for CPO articles FY2017 – FY2021.

### **Summary Metrics**

Indicator	Number
Total number of publications	1,359
Total number times of these 452 publications have been cited	26,063
Average citations per publication	19.18
Percentage of documents cited at least once	90%
NSSL h-index	65
Percentage of documents in the top 10%*	23.84%

**Table 1. Common Bibliometric Indicators** calculated for CPO peer-reviewed articles. An h-index of 65 indicates that this group of 1,359 articles includes 65 articles that have each received 65 or more citations. \*Percentage of documents in the top 10% is calculated based on the number of articles that ranked in the top 10% of publications in Web of Science based on citations by category, year and document type; 23.84% of CPO articles published between FY2017 and FY2021 ranked in the top 10% of all articles in the same category published in the same year.

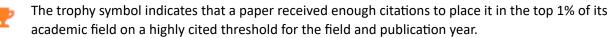


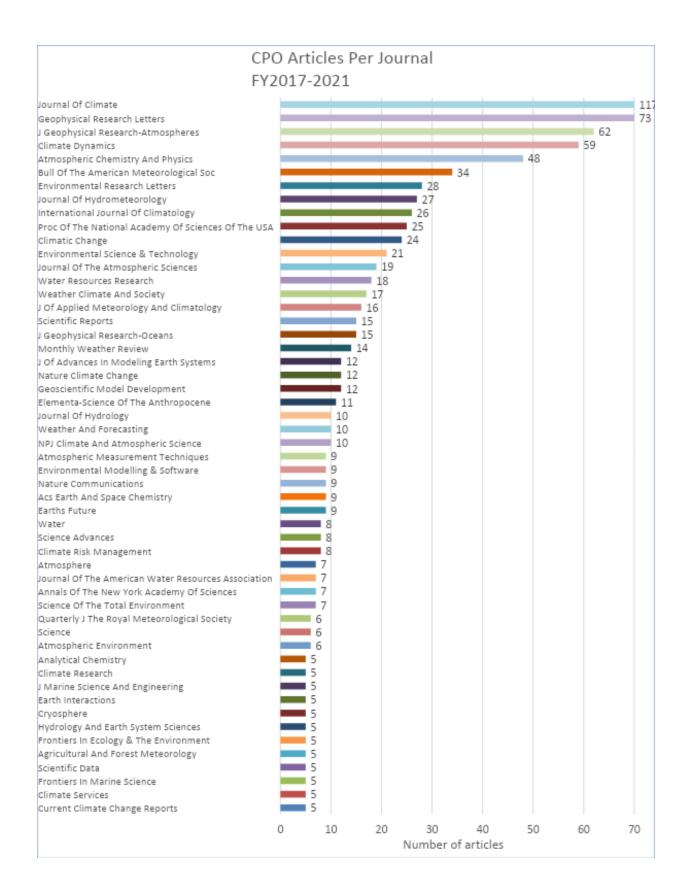
**Figure 1.** Number of CPO articles published annually, 2016-2021.

Table 2. CPO top-cited articles FY2017-2021	Times cited
<ul> <li>Beck, H. E., Zimmermann, N. E., McVicar, T. R., Vergopolan, N., Berg, A., &amp; Wood, E.</li> <li>F. (2018). Present and future Koppen-Geiger climate classification maps at 1-km resolution. <i>SCIENTIFIC DATA</i>, <i>5</i>. doi:10.1038/sdata.2018.214</li> </ul>	866 🛫
Abatzoglou, J. T., & Williams, A. P. (2016). Impact of anthropogenic climate change on wildfire across western US forests. <i>PROCEEDINGS OF THE NATIONAL</i> <i>ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 113</i> (42), 11770-11775. doi:10.1073/pnas.1607171113	811 •
Pelling, M., & High, C. (2005). Understanding adaptation: What can social capital offer assessments of adaptive capacity? <i>GLOBAL ENVIRONMENTAL</i> <i>CHANGE-HUMAN AND POLICY DIMENSIONS</i> , <i>15</i> (4), 308-319. doi:10.1016/j.gloenvcha.2005.02.001	484
Lemos, M. C., Kirchhoff, C. J., & Ramprasad, V. (2012). Narrowing the climate information usability gap. NATURE CLIMATE CHANGE, 2(11), 789-794. doi:10.1038/NCLIMATE1614	439 🟆
Abatzoglou, J. T., Dobrowski, S. Z., Parks, S. A., & Hegewisch, K. C. (2018). Data Descriptor: TerraClimate, a high-resolution global dataset of monthly climate and climatic water balance from 1958-2015. <i>SCIENTIFIC DATA, 5</i> . doi:10.1038/sdata.2017.191	361 🜪
Balch, J. K., Bradley, B. A., Abatzoglou, J. T., et al. (2017). Human-started wildfires expand the fire niche across the United States. <i>PROCEEDINGS OF THE</i> <i>NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA</i> , <i>114</i> (11), 2946-2951. doi:10.1073/pnas.1617394114	288
Huang, J. P., Yu, H. P., Dai, A. G., Wei, Y., & Kang, L. T. (2017). Drylands face potential threat under 2 degrees C global warming target. <i>NATURE CLIMATE</i> <i>CHANGE</i> , 7(6), 417-+. doi:10.1038/NCLIMATE3275	268 🟆
Meadow, A. M., Ferguson, D. B., Guido, Z., Horangic, A., Owen, G., & Wall, T. (2015). Moving toward the Deliberate Coproduction of Climate Science Knowledge. WEATHER CLIMATE AND SOCIETY, 7(2), 179-191. doi:10.1175/WCAS-D-14-00050.1	223
Mote, P. W., Li, S. H., Lettenmaier, D. P., Xiao, M., & Engel, R. (2018). Dramatic declines in snowpack in the western US. NPJ CLIMATE AND ATMOSPHERIC SCIENCE, 1. doi:10.1038/s41612-018-0012-1	198 🟆
Bowman, D., Williamson, G. J., Abatzoglou, J. T., Kolden, C. A., Cochrane, M. A., & Smith, A. M. S. (2017). Human exposure and sensitivity to globally extreme wildfire events. <i>NATURE ECOLOGY &amp; EVOLUTION</i> , 1(3). doi:10.1038/s41559-016-0058	191 🜪
L'Heureux, M. L., Takahashi, K., Watkins, A. B., et al. (2017). OBSERVING AND PREDICTING THE 2015/16 EL NINO. <i>BULLETIN OF THE AMERICAN</i> <i>METEOROLOGICAL SOCIETY, 98</i> (7), 1363-1382. doi:10.1175/BAMS-D-16-0009.1	185 🏆
Udall, B., & Overpeck, J. (2017). The twenty-first century Colorado River hot drought and implications for the future. <i>WATER RESOURCES RESEARCH, 53</i> (3), 2404-2418. doi:10.1002/2016WR019638	166 •

Box, J. E., Colgan, W. T., Christensen, T. R., et al. (2019). Key indicators of Arctic climate change: 1971-2017. ENVIRONMENTAL RESEARCH LETTERS, 14(4). doi:10.1088/1748-9326/aafc1b	164 🜪
Nguyen, J. L., Yang, W., Ito, K., Matte, T. D., Shaman, J., & Kinney, P. L. (2016). Seasonal Influenza Infections and Cardiovascular Disease Mortality. <i>JAMA</i> <i>CARDIOLOGY</i> , 1(3), 274-281. doi:10.1001/jamacardio.2016.0433	161
<ul> <li>Williams, A. P., Abatzoglou, J. T., Gershunov, A., Guzman-Morales, J., Bishop, D. A., Balch, J. K., &amp; Lettenmaier, D. P. (2019). Observed Impacts of Anthropogenic Climate Change on Wildfire in California. <i>EARTHS FUTURE</i>, 7(8), 892-910. doi:10.1029/2019EF001210</li> </ul>	154 🝷
Slivinski, L. C., Compo, G. P., Whitaker, J. S., et al. (2019). Towards a more reliable historical reanalysis: Improvements for version 3 of the Twentieth Century Reanalysis system. <i>QUARTERLY JOURNAL OF THE ROYAL</i> <i>METEOROLOGICAL SOCIETY, 145</i> (724), 2876-2908. doi:10.1002/qj.3598	150 🜪
Butler, A. H., Sjoberg, J. P., Seidel, D. J., & Rosenlof, K. H. (2017). A sudden stratospheric warming compendium. <i>EARTH SYSTEM SCIENCE DATA</i> , 9(1), 63-76. doi:10.5194/essd-9-63-2017	145 🜪
Dai, A. G., Luo, D. H., Song, M. R., & Liu, J. P. (2019). Arctic amplification is caused by sea-ice loss under increasing CO2. NATURE COMMUNICATIONS, 10. doi:10.1038/s41467-018-07954-9	144 🜪
Polade, S. D., Gershunov, A., Cayan, D. R., Dettinger, M. D., & Pierce, D. W. (2017). Precipitation in a warming world: Assessing projected hydro-climate changes in California and other Mediterranean climate regions. <i>SCIENTIFIC REPORTS,</i> <i>7</i> . doi:10.1038/s41598-017-11285-y	142 •
Hao, Z. C., Singh, V. P., & Xia, Y. L. (2018). Seasonal Drought Prediction: Advances, Challenges, and Future Prospects. <i>REVIEWS OF GEOPHYSICS</i> , 56(1), 108-141. doi:10.1002/2016RG000549	141 •
	1

**Table 2:** List of the twenty most highly cited CPO articles published between FY2017 and FY2021.







**Figure 2.** Journals in which CPO has published in five or more times between FY2017 and FY2021. CPO articles were published in 214 titles between FY2017 and FY2021.

**Figure 3.** CPO articles appeared in journals categorized in 71 distinct research areas as defined and assigned by Web of Science. The top fifteen research areas by number of publications are presented here. Articles are assigned to subject categories by WoS based on the journal in which the article appeared. These subject categories are not mutually exclusive.

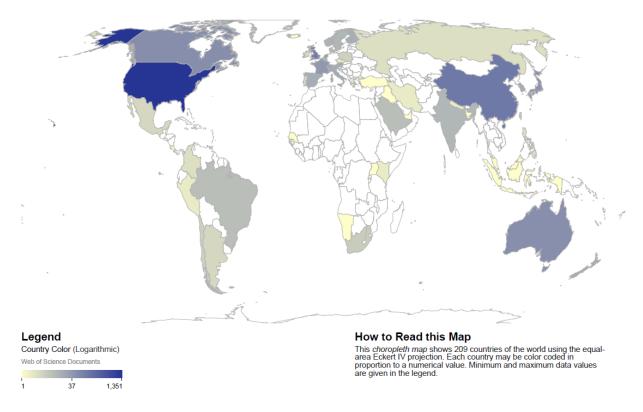
# COLLABORATION

This section explores coauthor and institutional relationships.

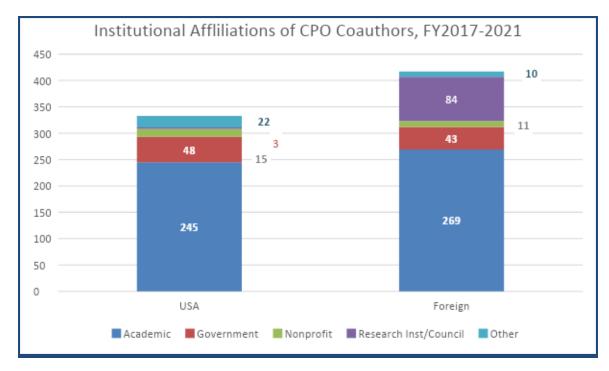
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	University of Miami	

University of Nebraska System	30
Texas A&M University System	30

 Table 3. Top institutional affiliations of collaborating authors on CPO articles FY2017-2021.



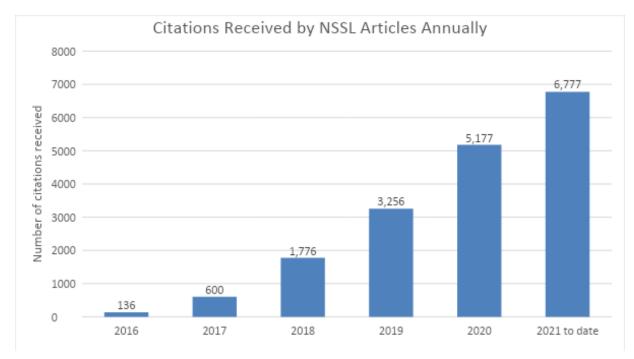
**Figure 4.** Geographic map illustrating CPO's international collaborations on articles published between FY2017 and FY2021.



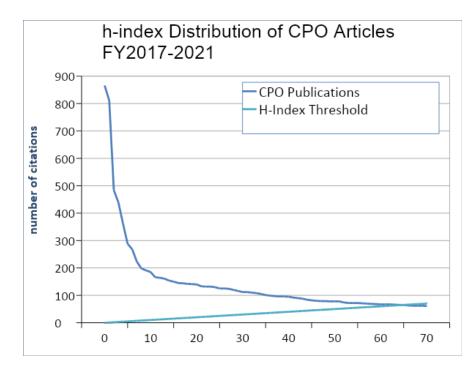
**Figure 5.** Count of coauthoring organizations as sorted by type. CPO authors coauthored articles affiliated with 750 organizations between FY2017 and FY2021.

## IMPACT

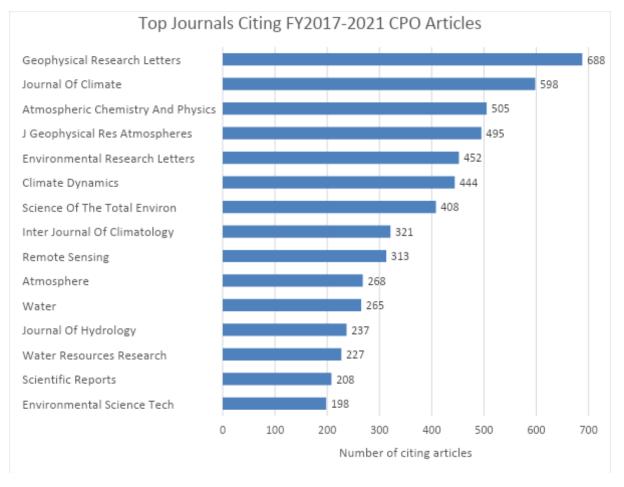
This section analyzes the 18,091 publications citing 1,359 CPO articles for insights into the value and impact of CPO research.



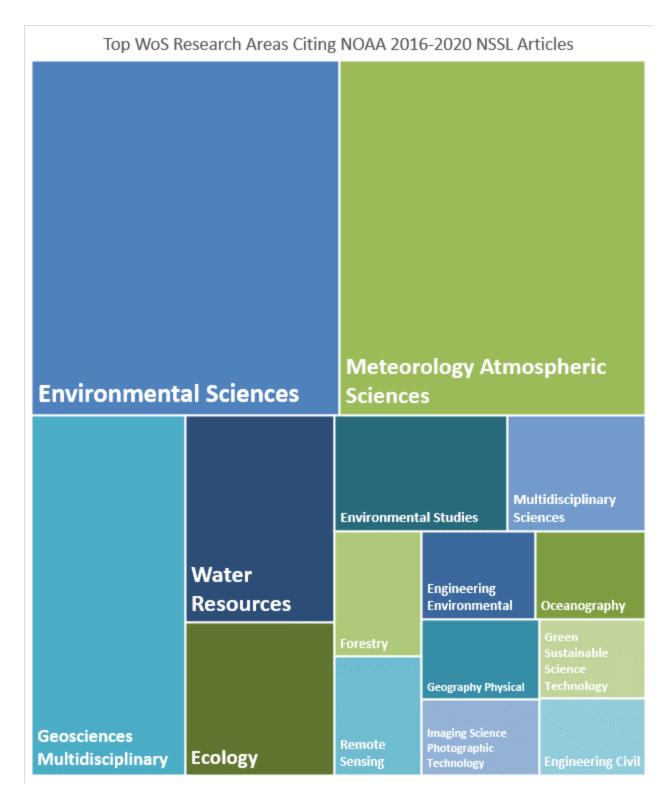
**Figure 6:** Non-cumulative number of citations received by this set of CPO articles between 2016 and December 2021.



**Figure 7:** Distribution curve showing the citation counts of the 75 most highly cited CPO articles between FY2017 and FY2021. The straight line indicates the H-Index threshold (slope: y = x). The intersect point of the two curves (65) is the H-Index of CPO articles.



**Figure 8:** The 1,359 CPO articles analyzed in this report have been cited in 2,021 distinct titles. The top fifteen titles are shown here.



**Figure 9:** The fifteen most common Web of Science research areas in which these CPO articles were published in. Articles are assigned to subject categories by WoS based on the journal in which the article appeared. These subject categories are not mutually exclusive.



**Figure 10:** The 1,359 CPO articles analyzed in this report have been cited by authors affiliated with more than 8,000 organizations. The top twenty of these organizations are shown here.

## APPENDIX 1: RESPONSIBLE USE OF BIBLIOMETRICS

When used alongside other evaluative measures, bibliometrics can be a useful tool for evaluating research. However, all bibliometric indicators have limitations and should not be used out of context or applied without a full understanding of their intended use. No single metric can provide a rounded overview of research performance so responsible use of metrics requires using multiple metrics and providing context for those metrics. It can be helpful to think of a bibliometric analysis as a story where each indicator is a plot point. Additionally, bibliometrics should not be used as the sole basis for decision-making or for evaluating the work of either an individual or group.

## Some Pros & Cons of Bibliometrics

#### Pros

- Quantitative, objective and reproducible
- Easy to understand and easily updated
- Fully scalable from individual- to country-level

#### Cons

- Datasets, particularly from standard databases like Web of Science (WOS), may represent only a portion of existing publications
- Most indicators are skewed and are vulnerable to manipulation by authors & publishers. H-index for example highly favors authors with longer careers.
- Indicators don't necessarily mean what we think they mean (e.g. a high citation count may be the result of "negative" citations rather than an indicator of quality)

Further reading on the responsible use of bibliometrics:

Aksnes, D. W., L. Langfeldt, & P. Wouters. 2019. Citations, Citation Indicators, and Research Quality: An Overview of Basic Concepts and Theories. SAGE Open, 9. doi:10.1177/2158244019829575.

Barnes, C. 2017. The h-index debate: An introduction for librarians. The Journal of Academic Librarianship 43:487-494, doi:10.1016/j.acalib.2017.08.013.

Belter, C.W. 2015. Bibliometric indicators: Opportunities and limits. Journal of the Medical Library Association. 103(4):219-221. doi:10.3163/1536-5050.103.4.014.

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## **APPENDIX 2: METHOD AND SOURCES**

This report provides a bibliometric analysis of publications produced by the NOAA Climate Program Office (CPO) from October 2016 to September 2021. For our data source, we used publication lists provided by CPO. Because we use the WoS analytical tools for our bibliometric analyses, CPO publications that do not appear in WoS have been omitted from the data set. Bibliographic citations and citation data were downloaded from WoS and Clarivate InCites.

Although we have included publication and citation data through December 2021 in our data set, it is generally agreed that publications must be at least two years old for citation reporting to be meaningful. Therefore it should be noted that the citation data for the more recent publications is preliminary and is most likely not indicative of their eventual impact.

Publication and citation data were downloaded from Web of Science and InCites on December 20, 2021. Because of slight differences in indexing schedules and algorithms, citation data can vary slightly between WoS and InCites. The full publication list and data sets are from Sarah.Davis@noaa.gov