National Oceanographic and Atmospheric Administration
US Department of Commerce

A Bibliometric Analysis of Articles Sponsored by NOAA's Office of Ocean Exploration and Research

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NOAA Central Library

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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 research sponsored by NOAA's Office of Ocean Exploration and Research (OER). This report was produced using data retrieved from the Web of Science, Science Citation Index Expanded database on 02 April, 2012. 54 articles known to have resulted from OER-funded research had to be omitted from this analysis, either because the articles are still in press or because Web of Science does not index the journals in which the articles were published. 16 of these omitted articles were produced with support from OER's underwater archaeology program.

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 citations to OER-sponsored research from peer-reviewed journals outside of Web of Science or from other sources such as book chapters, conference proceedings, or technical reports.

More information about the methodology used and a full listing of all of the articles evaluated in this report are available upon request to Chris.Belter@noaa.gov.

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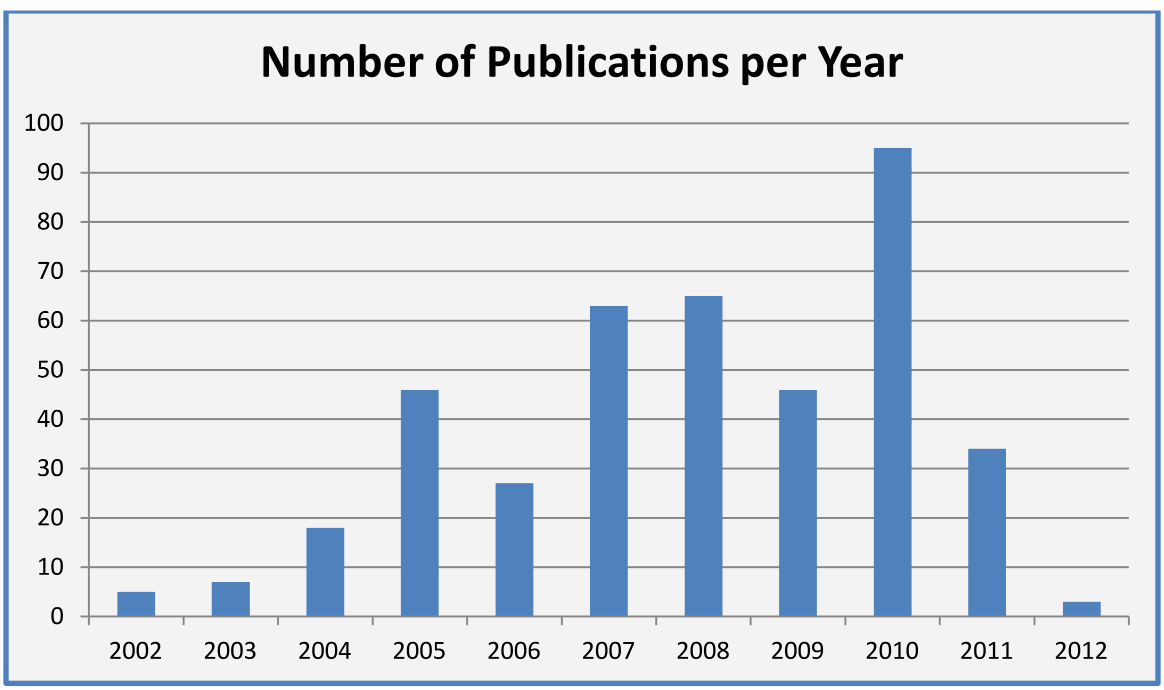
Summary Metrics

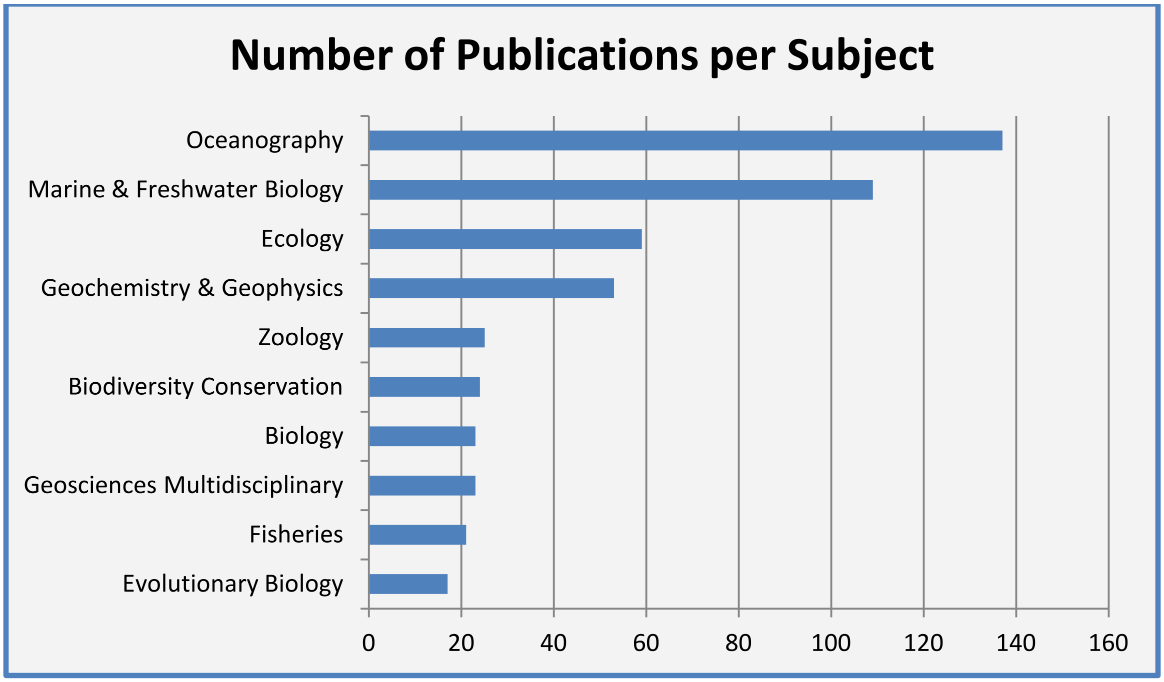
Bibliometric Indicator	Value
Number of Publications (p)	409
Total Number of Citations Received (c)	4,219
Average Number of Citations per Paper (c/p)	10.32
H- Index*	30

*An H-Index of 30 means that this group of 409 publications includes 30 articles that have received 30 or more citations each. For more details on the H-Index, see Hirsch (2005).

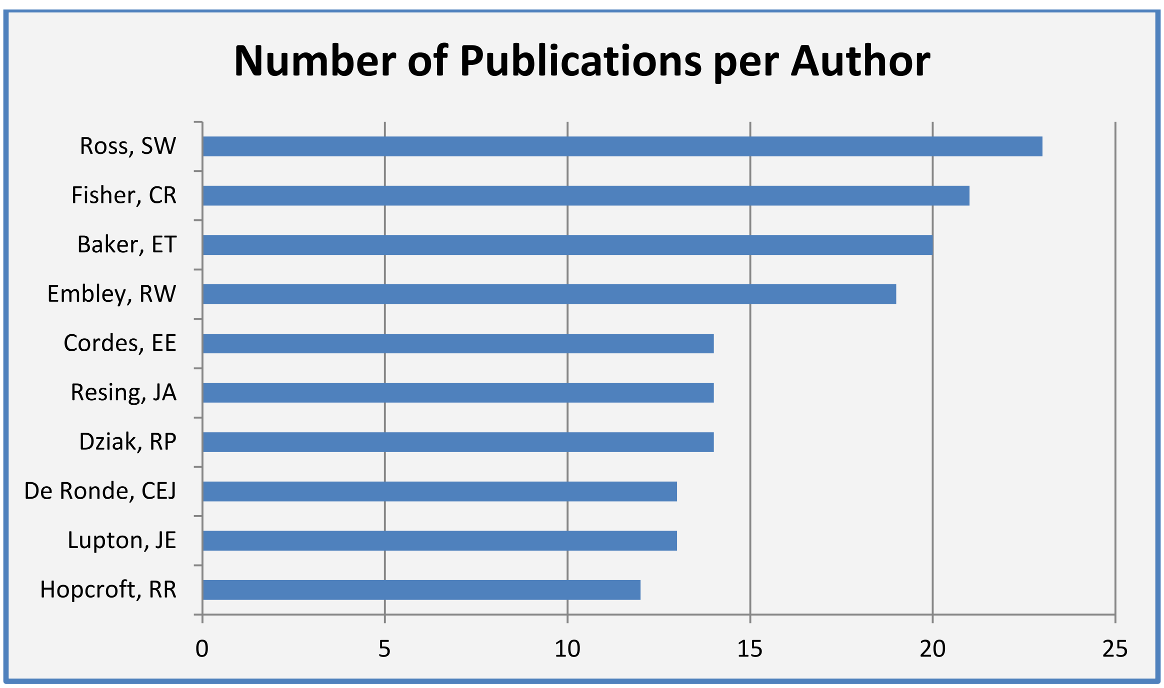
Publication Analysis

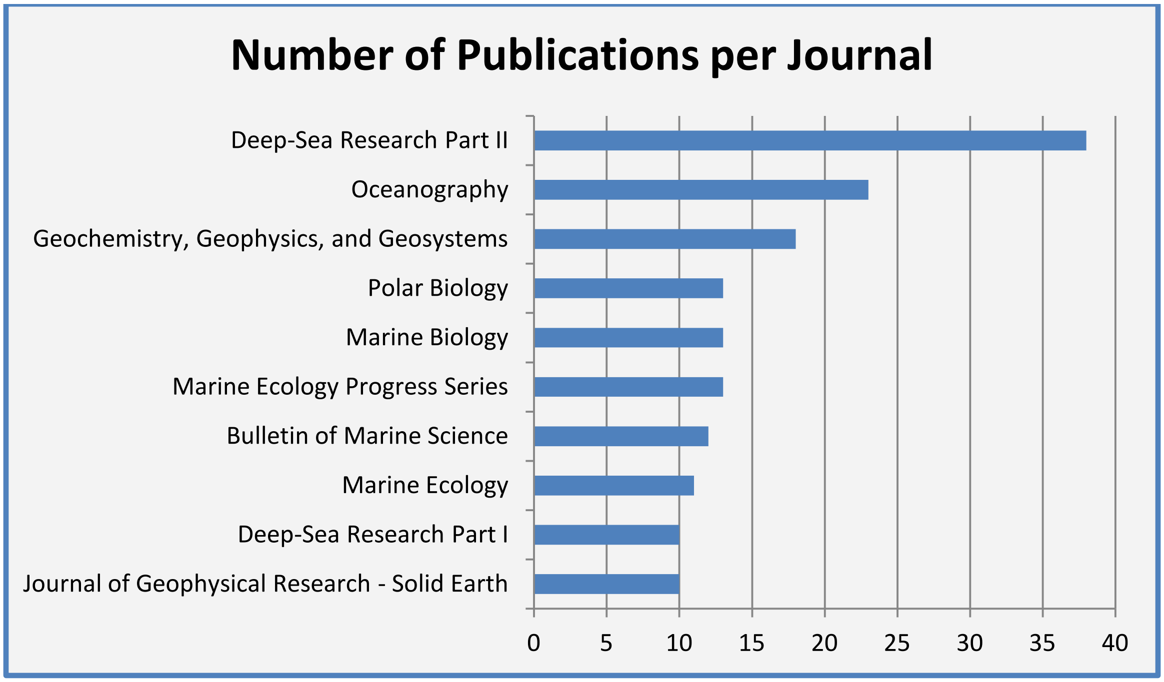
The following tables analyze the number of publications produced as a result of OER-sponsored research. For brevity, the tables showing the number of publications per subject, author, journal, and institution only list the top 10 results in each category.



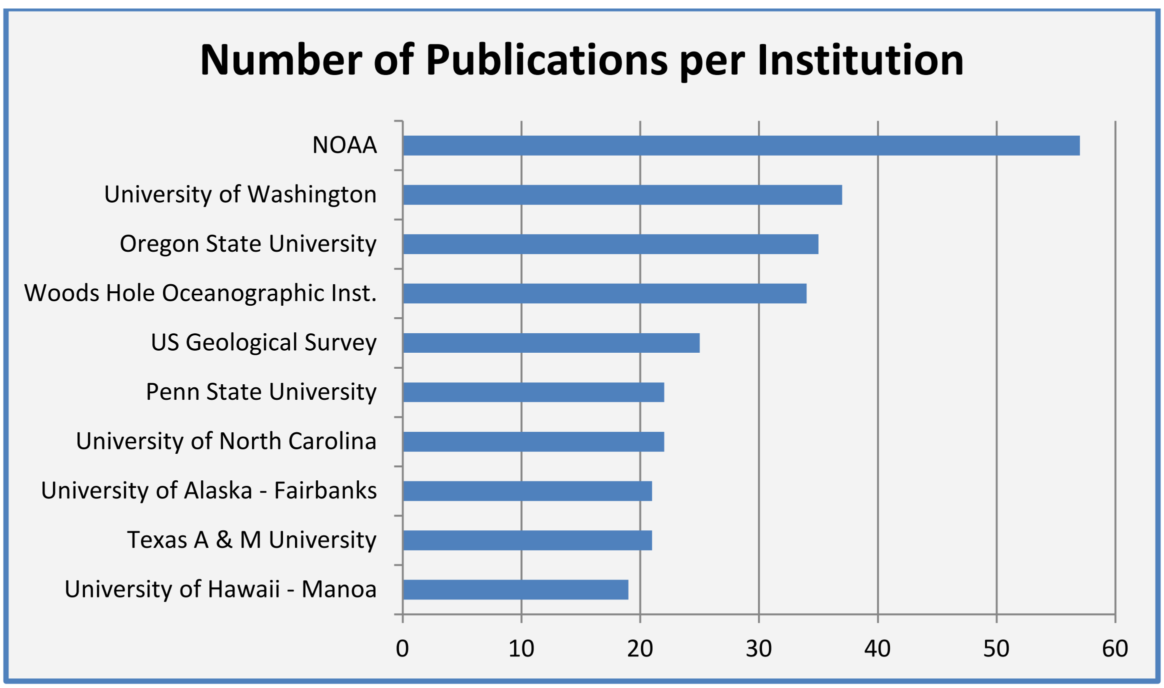


*Subject categories are defined and assigned to articles automatically by Web of Science based on the journal in which an article appears. These subject categories are not mutually exclusive.

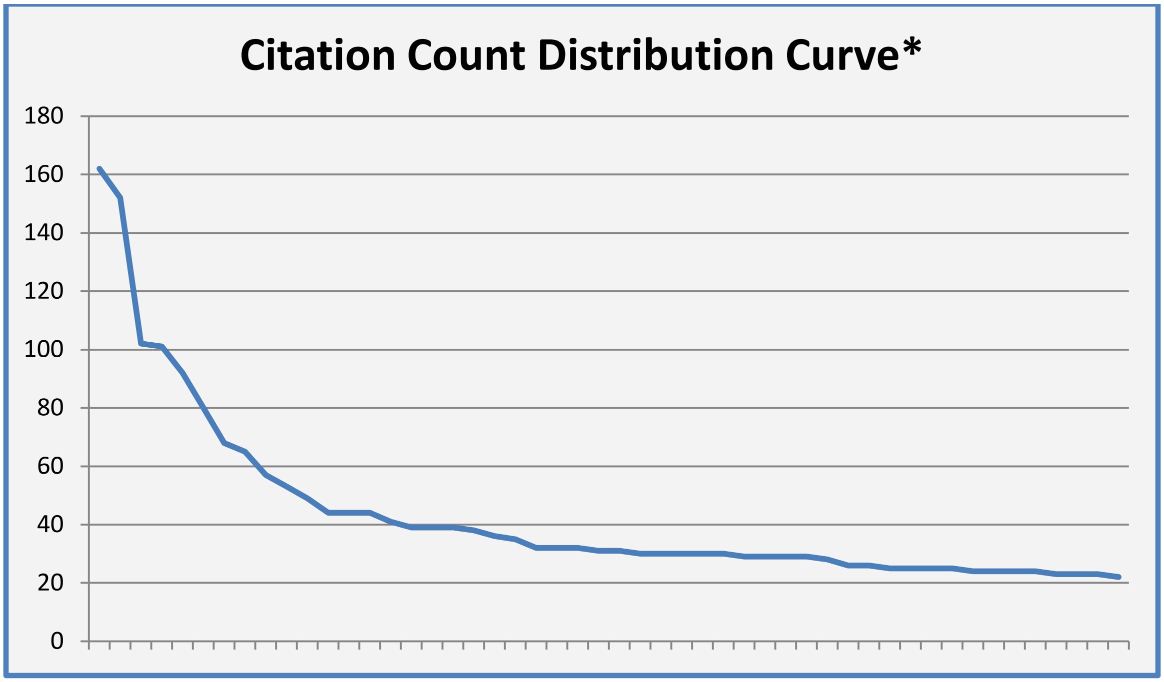




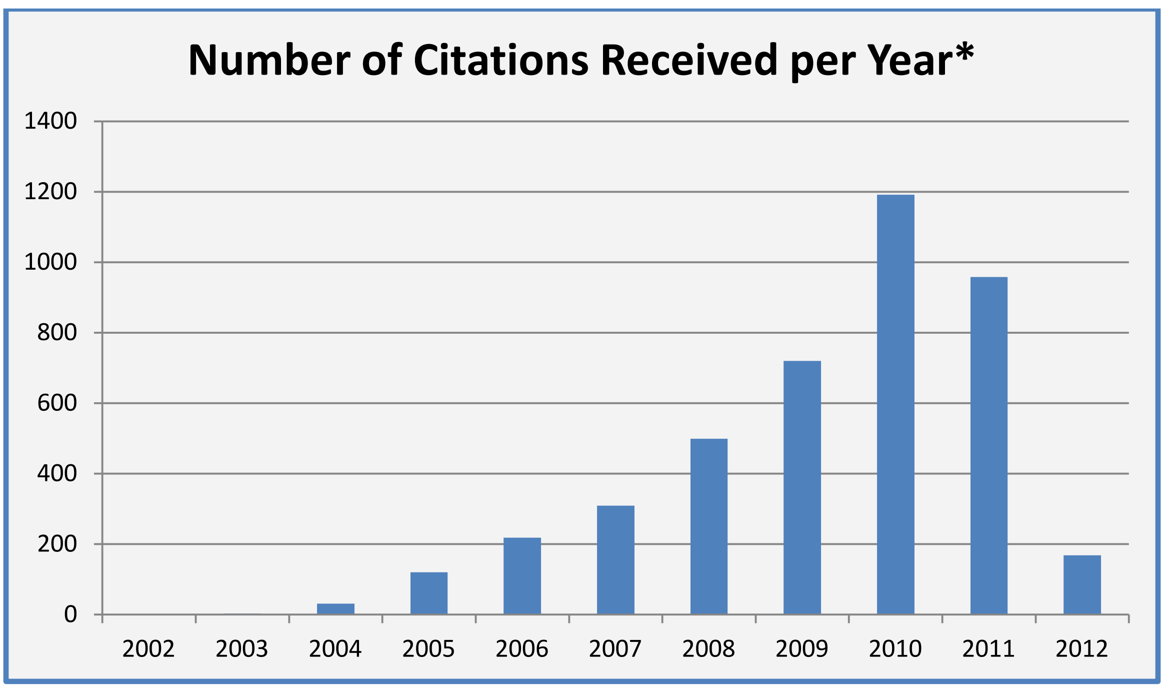
Note: Journal special issues on OER research explorations include: Deep-Sea Research Part II (v.57 i.1-2, i.21-23, and i.24-26), Oceanography (v.20 i.4), and Polar Biology (v.28 i.3).



Citation Count Analysis



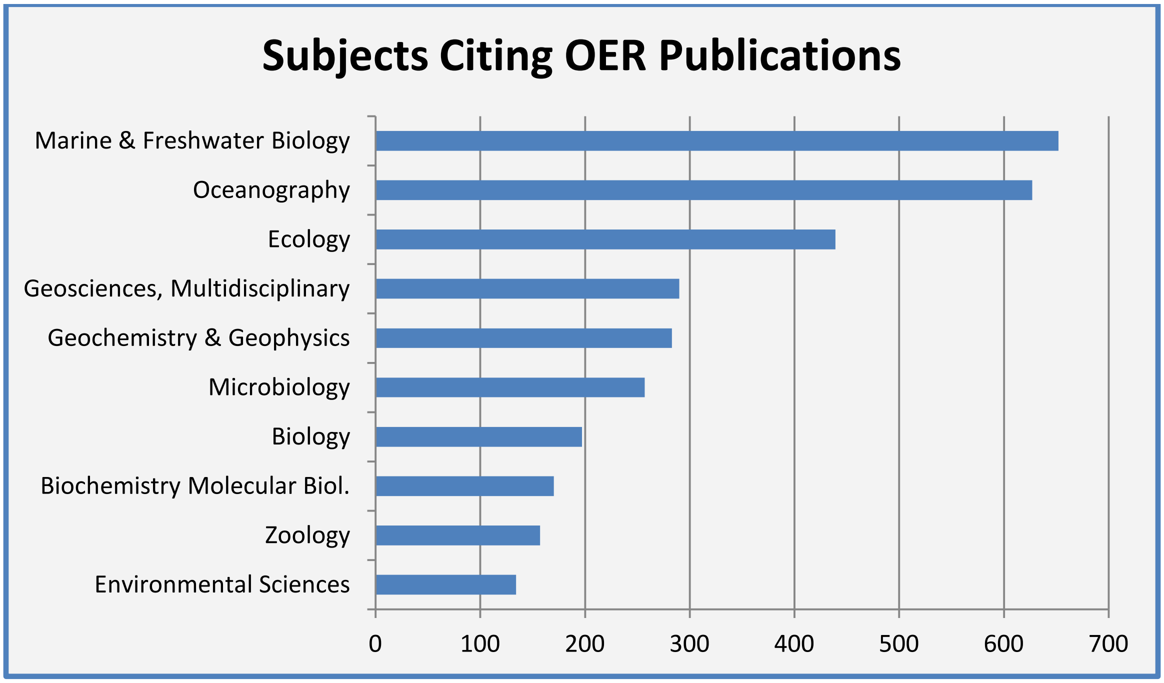
*Top 50 articles by citation count shown

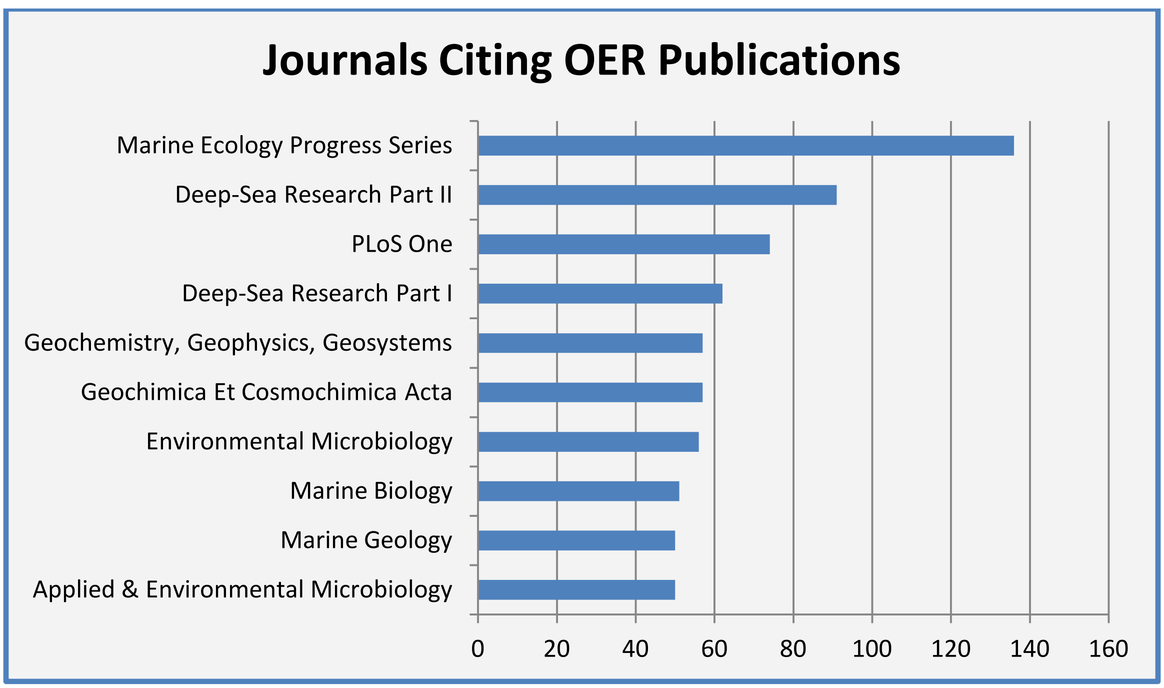


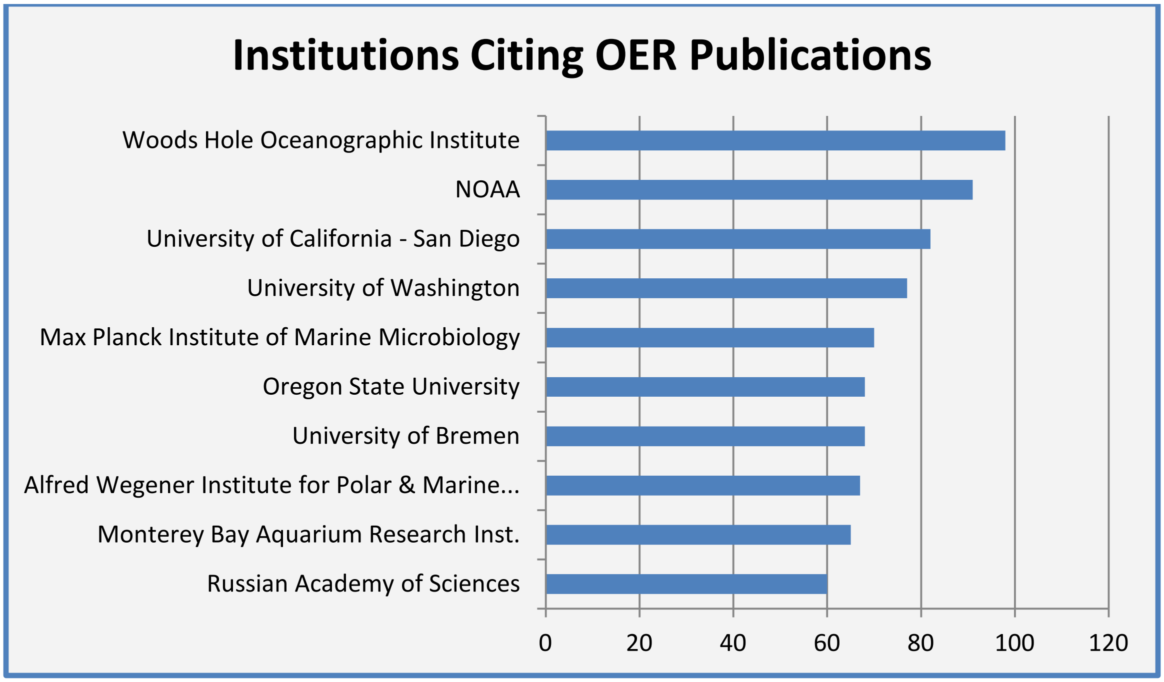
*Non-cumulative number of citations received by all 409 articles in this set per year

Citing Article Analysis

The following tables analyze the articles that cite OER-sponsored journal articles in order to determine the subjects, journals, and institutions citing OER-sponsored research. These tables include self-citations. For brevity, the tables only include the top 10 results in each category.







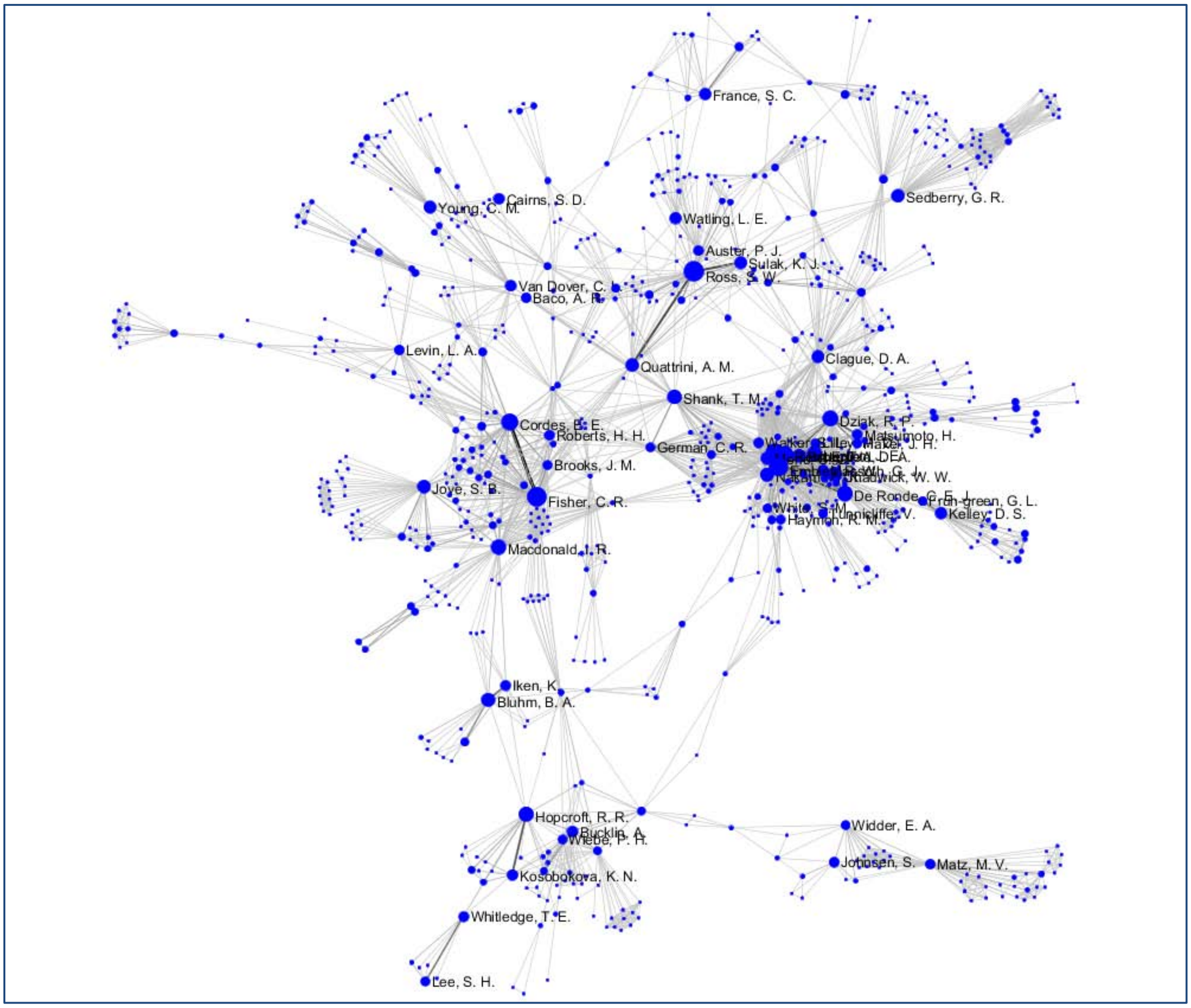
Bibliometric Mapping

Bibliometric maps attempt to create visual representations of the structure of scientific research by analyzing networks of scientific publications. Depending on the level of analysis, bibliometric maps attempt to show the relationships between different lines of research on a single topic, between sub-disciplines within a field, and between major disciplines. Such maps can be constructed depicting co-authorship networks (Newman 2001), article citation networks (Boyack and Klavans 2010), or article keyword networks (Mane and Borner 2004). For an extensive survey of the field, see Borner and others (2003).

The following maps depict the co-authorship and paper citation networks of OER journal articles indexed in Web of Science. These maps were generated using the Science of Science Mapping Tool (Sci2 Team 2009). Additional images showing these maps in more detail are available upon request.

Co-Authorship Network

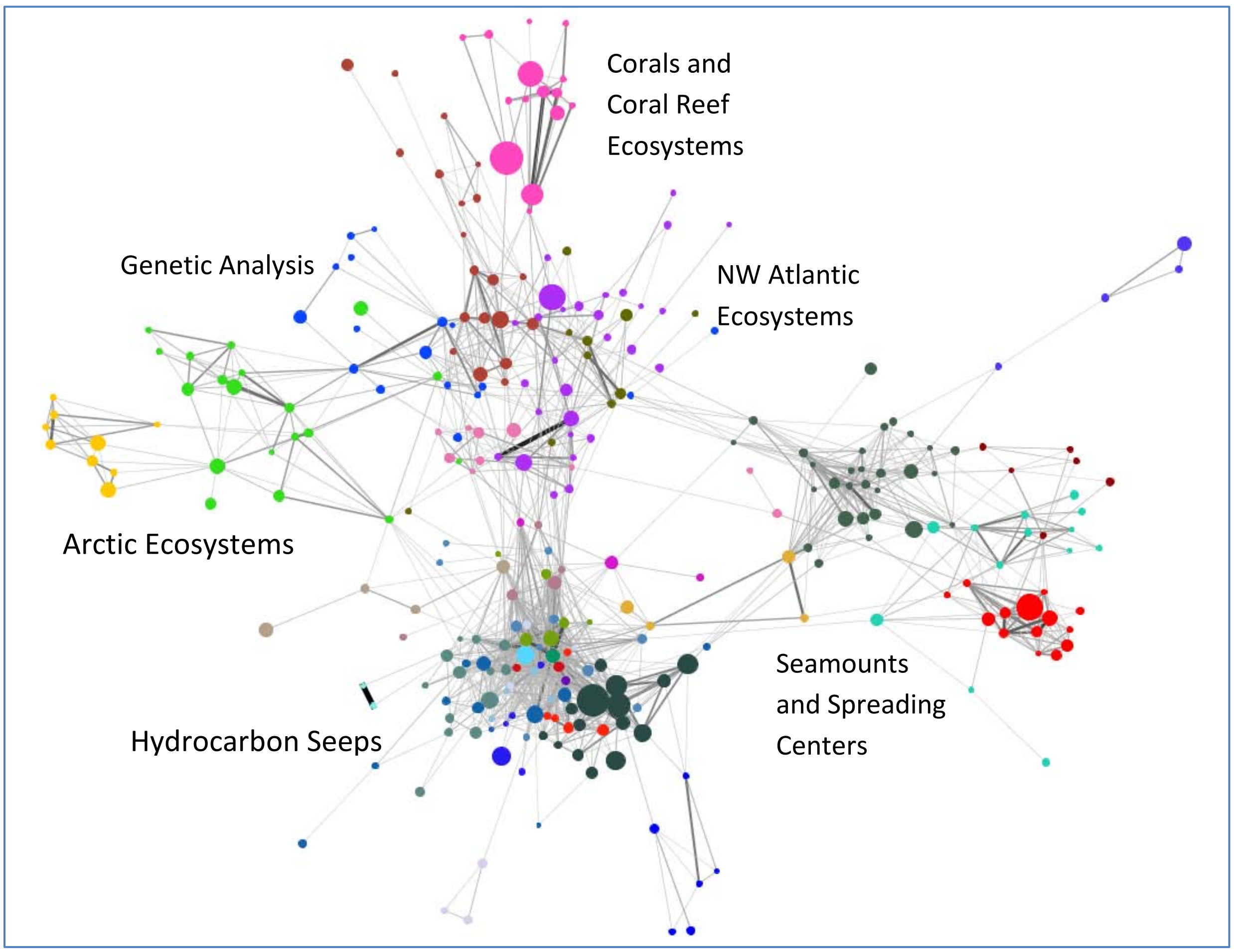
The following map depicts the largest connected co-authorship network of authors of OER-supported research. This map was produced using a cleaned and expanded version of the publication data used in the rest of this report. In this map, nodes represent authors and edges represent co-authored works. Node size is proportional to the number of publications by that author; values range from 1 to 24 publications. Edge size and darkness are proportional to the number of co-authored works between the connected authors; values range from 1 to 14. Author names are displayed for authors who have published 5 or more OER-supported articles.



This map shows 3,624 co-author relationships between 784 of the 1,002 authors of OER-sponsored works.

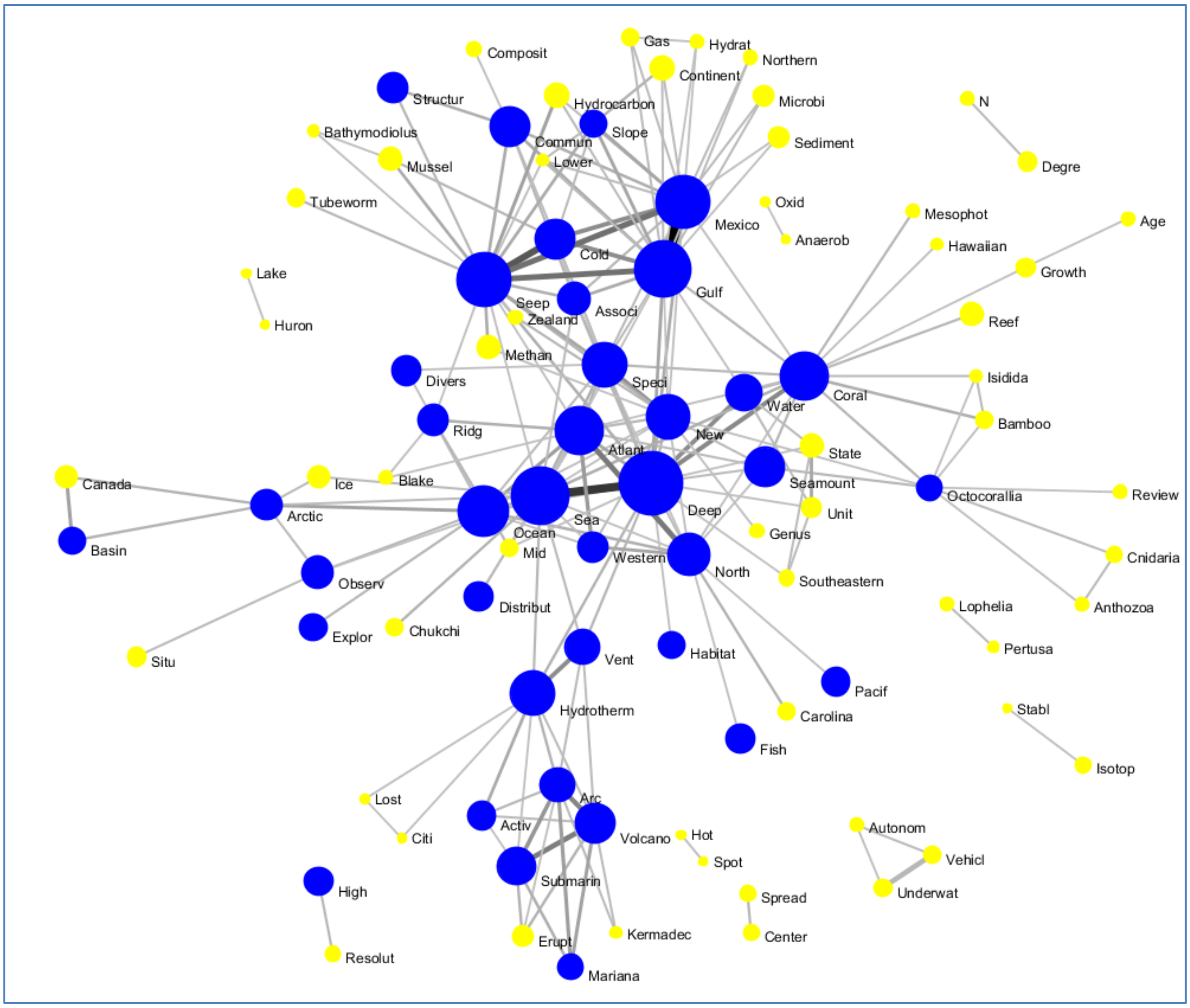
Article Bibliographic Coupling Network

The following map depicts the bibliographic coupling network of 300 of the 409 articles in this set. Bibliographic coupling (Kessler 1963) is a method of grouping papers into topical clusters based on the number of cited references they share. The larger the number of common references between two articles, the higher the probability that they are about the same topic. The 300 articles depicted on this map had the highest similarity ranking based on the bibliographic coupling method. As such, they are representative of the major topics covered by OER-sponsored journal articles. In this map, nodes represent articles and edges represent bibliographic coupling links. Node size is proportional to the article's citation count; paper citation counts range from 0 to 162 citations. Node colors represent paper communities identified by the community detection algorithm developed by Blondel and others (2008). Community labels have been added to the map based on a review of the articles grouped in each community. Edge size and darkness are proportional to the number of shared references between the connected articles; the number of shared references depicted ranges from 3 to 41. For clarity, edges with a weight of less than 3 were removed and only the giant component is shown.



Word Co-Occurrence Network

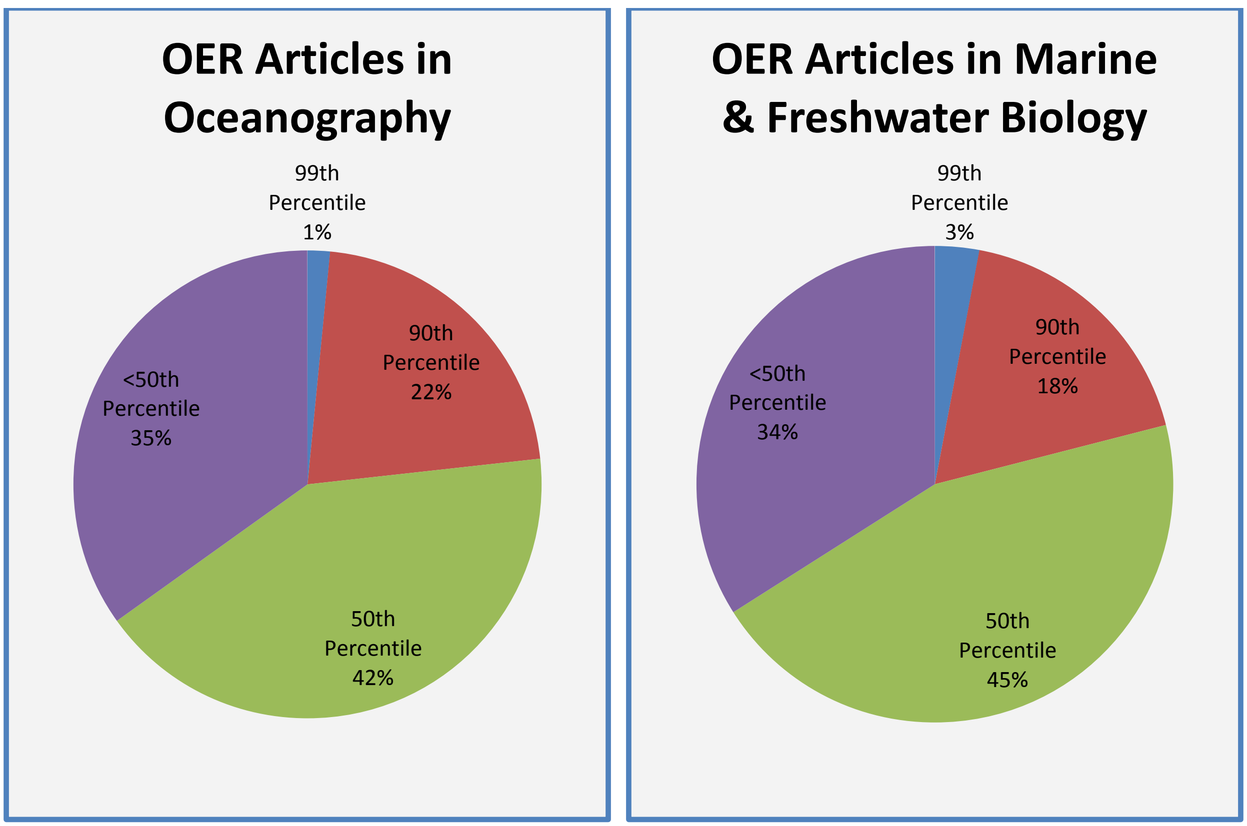
The following map depicts the relationships between the 95 words most commonly co-occurring in OER-sponsored journal articles. These words were drawn from article titles only, not from the abstract or the full text of these articles. In the map, nodes represent words and edges represent articles in which the two words connected both appear. For clarity, only words co-occurring in at least 5 article titles are depicted. Node size is proportional to the number of articles in which the word appears; these values range from 5 articles to 72 articles. Nodes colored blue indicate words occurring in 15 or more article titles. Edge size and darkness are proportional to the number of articles in which the two words occur; these values range from 5 articles to 51 articles.



Citation Performance Evaluation

In order to put the citation counts of OER-sponsored articles into context, the citation count of each OER publication published between 2002 and 2010 in the most common subject categories – Oceanography and Marine & Freshwater Biology – were compared to those of all papers published in the same subjects in the same years. Each article was assigned a percentile rank (99th percentile, 90th percentile, 50th percentile, below 50th percentile) within its subject and publication year based on its citation count. Total numbers of articles in each percentile across all years were then calculated and compared to the total number of OER articles in these subject categories by calculating the percentage of OER publications ranked in each percentile.

The chart below summarizes the results of this method. Each section of the chart represents the percentage of OER articles ranked in each percentile for its subject and year. For examples of similar methodologies and discussion, see Leydesdorff and others (2011), the National Science Board, (2010), and Pudovkin and Garfield (2009).



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