# 2018 Scientific Ocean Drilling Bibliographic Database Report

Covering records related to the Deep Sea Drilling Project,
Ocean Drilling Program, Integrated Ocean Drilling Program,
and International Ocean Discovery Program
from 1969 through June 2018

Produced by
International Ocean Discovery Program
Publication Services

September 2018

#### Introduction

This Scientific Ocean Drilling Bibliographic Database Report demonstrates the impact of Program science through publications from the Deep Sea Drilling Project (DSDP), Ocean Drilling Program (ODP), Integrated Ocean Drilling Program, and International Ocean Discovery Program (IODP). The number of bibliographic records indexed by the American Geosciences Institute (AGI) in the Scientific Ocean Drilling Bibliographic Database (previously named the Ocean Drilling Citation Database) as of June 2018, "cited-by" statistics obtained through CrossRef and Google Scholar in July 2018, and links to Altmetric scores for high-impact papers are presented in tables and charts that demonstrate trends for both authorship and usage.

#### Report categories

Data collected for the annual Scientific Ocean Drilling Bibliographic Database Report are divided into two main categories:

- Program records: publications produced and published by DSDP, ODP, the Integrated Ocean Drilling Program, or IODP. These records include but are not limited to the *Initial Reports of the Deep Sea Drilling Project*; the *Initial Reports* and *Scientific Results* volumes of ODP; the *Proceedings* volumes of the Integrated Ocean Drilling Program and IODP, the report and technical note series from each Program, and *Scientific Drilling*.
- Non-Program records: Program-related scientific research published in the open literature.

Non-Program publications are further categorized into three groups:

- **Serial** records: drawn from any periodically produced analytic or monographic journal or report, especially those that are peer reviewed, but may also include reports from universities, organizations, or government entities (e.g., *Open-File Reports—U.S. Geological Survey*).
- Theses and dissertations: Bachelor's and Master's theses and Ph.D. dissertations.
- Miscellaneous records: books, reports, monographs, maps, abstracts, posters, newsletters, videos, and CD-ROM/DVD-ROMs.

#### Overview

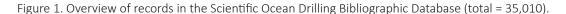
The Scientific Ocean Drilling Bibliographic Database is a subset of AGI's GeoRef database. To generate the GeoRef database, AGI indexes and records bibliographic data from approximately 3,800 domestic and international publications. AGI also has arrangements to acquire metadata with many publishers, including Springer, Elsevier, the American Association for the Advancement of Science, Copernicus,

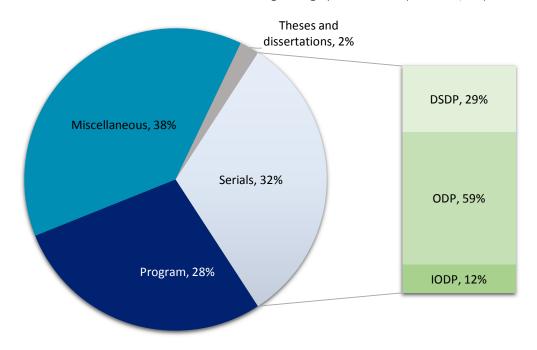
Wiley/Blackwell, the American Geophysical Union, and most of the Geoscience World publishers. In addition, IODP Publication Services notifies AGI when Program publications are released.

AGI produces the Scientific Ocean Drilling Bibliographic Database in collaboration with IODP. AGI uses a series of keywords to extract bibliographic records related to Program research from the GeoRef database. The database resides on the AGI server (<a href="http://iodp.americangeosciences.org/vufind">http://iodp.americangeosciences.org/vufind</a>) and is updated weekly. Metadata associated with each record can be saved to a personalized list, texted or emailed, or exported into common bibliographic software. The database also generates references in several formats.

Depending on the source from which AGI acquires its information, there may be a significant delay after publication before a record is included in the GeoRef database and later in the Scientific Ocean Drilling Bibliographic Database. There is no guarantee that all publication venues for Program research are included in GeoRef or the Scientific Ocean Drilling Bibliographic Database, but scientific publications throughout the world are represented.

As of June 2018, the database contains 35,010 records containing metadata from publications published from 1969 to 2018 (beginning of DSDP to present), including  $\sim$ 71% non-Program records and  $\sim$ 29% Program records (Figure 1). Since the 2017 report, 1,423 records have been added to the database. Figure 1 highlights the  $\sim$ 2% theses and dissertations (total =  $\sim$ 700) in the database, illustrating early career scientific research relating to the Program, and details serial publications related to IODP and its





predecessor programs. The IODP portion of the serial entries includes both Integrated Ocean Drilling Program and International Ocean Discovery Program records.

Figures 2 and 3 show serial publications by all authors from all countries with the number of contributions on a logarithmic scale. Figure 2 shows all Program publications (1969–2018); Figure 3 shows publications from the Integrated Ocean Drilling Program and IODP only (2003–2018). All maps in this report were generated using the Science of Science (Sci2) Tool (http://sci2.cns.iu.edu).

Figure 2. Serials by authors from all countries (1969–2018).

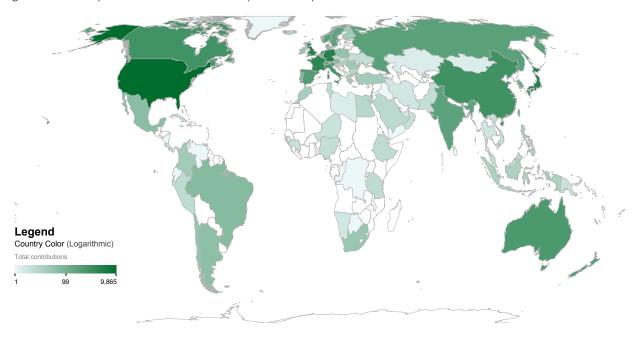
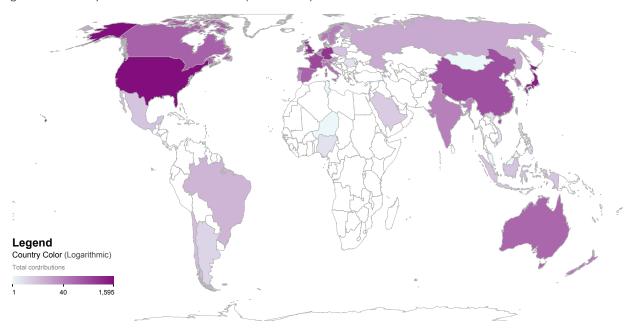


Figure 3. Serials by authors from all countries (2003–2018).



#### Publications from top-ranking peer-reviewed journals

Database records indicate that 11,073 Program-related papers have been published in non-Program, primarily peer-reviewed serial publications. A total of 5,972 of these research papers (more than 50% of the serial publications in the database) were published in 30 highly rated peer-reviewed journals, based on Thompson/Reuters ISI impact factor (Figure 4). Starting in 1996, ODP encouraged scientists to fulfill their ODP publication obligation by publishing postcruise research results in English language peer-reviewed journals. Approximately 71% of the papers illustrated in Figure 4 are Program-related research results that have been published in top-rated journals since 1996, the year the publication policy change took effect. Figure 4 also highlights papers that have been published in top-rated journals since 2014 and the start of IODP. Table 1 presents the data behind this graph, including the impact factor for each journal.

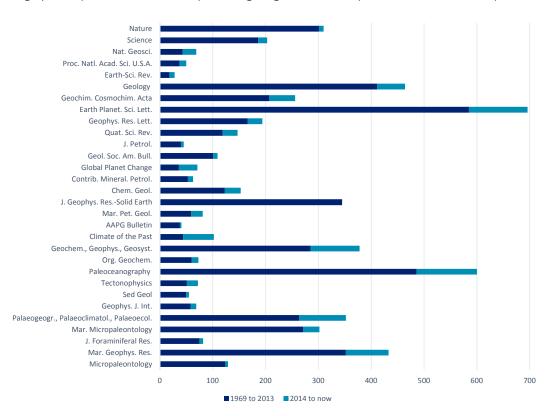


Figure 4. Highly rated peer-reviewed serials publishing Program-related expedition research results (1969–2018).

## Publications by authors from current member countries

Of the 11,073 Program-related papers published in serial publications, 9,668 (87%) are first-authored by scientists from current IODP member countries (Table 2). First authors are those who are listed first in the authorship of a paper. Contributing authors are those listed after the first authors. In Table 2, "Serial

Table 1. Highly rated peer-reviewed serials publishing Program-related expedition research results (1969–2018). Thompson/Reuters impact factor is given for each title.

Journal	T/R Impact Factor (2017)	1969 to 2013	2014 to present	Total
Nature	41.577	301	9	310
Science	41.058	186	17	203
Nature Geoscience	14.391	43	26	69
Proceedings of the National Academy of Sciences of the U.S.A.	9.504	37	13	50
Earth-Science Reviews	7.491	18	10	28
Geology	5.073	411	53	464
Geochimica et Cosmochimica Acta	4.690	207	49	256
Earth and Planetary Science Letters	4.581	585	111	696
Geophysical Research Letters	4.339	166	28	194
Quaternary Science Reviews	4.334	119	28	147
Journal of Petrology	4.100	40	5	45
Geological Society of America Bulletin	4.039	101	8	109
Global and Planetary Change	3.982	36	35	71
Contributions to Mineralogy and Petrology	3.626	53	10	63
Chemical Geology	3.570	123	30	153
Journal of Geophysical Research—Solid Earth	3.482	345	0	345
Marine and Petroleum Geology	3.281	59	22	81
AAPG Bulletin	3.208	38	3	41
Climate of the Past	3.174	44	58	102
Geochemistry, Geophysics, Geosystems	2.981	285	93	378
Organic Geochemistry	2.810	60	13	73
Paleoceanography	2.718	486	114	600
Tectonophysics	2.686	51	21	72
Sedimentary Geology	2.575	50	5	55
Geophysical Journal International	2.528	58	11	69
Palaeogeography, Palaeoclimatology, Palaeoecology	2.375	264	88	352
Marine Micropaleontology	1.874	271	31	302
Journal of Foraminiferal Research	1.511	75	7	82
Marine Geophysical Researches	0.913	352	81	433
Micropaleontology	0.877	124	5	129

contributions by country" shows the number of serial papers for which each country's researchers are listed as contributing authors. The country is counted once per paper regardless of the number of authors from that country. "Serial contributions by author" shows the number of times researchers from each country are listed as contributing authors, including multiple contributors from a single country per paper. The column "Total contributions" shows the total number of times researchers from each country are included in the authorship of peer-reviewed serials, including first and contributing authors and multiple contributors from a single country per paper.

Table 2. Serial publication authorship by first author, contributing country, contributing authors, and total contributions (1969–2018).

Member country or consortia	First authors of serials	Serial contributions by country	Serial contributions by author	Total contributions
Australia/New Zealand Consortium	310	453	558	868
Australia	180	300	347	527
New Zealand	130	153	211	341
Brazil	23	30	32	55
China	420	326	427	847
ECORD	4,073	5,239	6,691	10,764
Austria	15	38	39	54
Canada	322	409	489	811
Denmark	52	103	115	167
Finland	8	10	11	19
France	608	773	1,078	1,686
Germany	994	1,156	1,502	2,496
Ireland	5	22	24	29
Italy	278	345	453	731
Netherlands	222	259	278	500
Norway	140	187	217	357
Portugal	15	41	51	66
Spain	142	234	290	432
Sweden	104	134	139	243
Switzerland	133	198	214	347
United Kingdom	1,035	1,330	1,791	2,826
India	173	95	106	279
Japan	696	817	1,829	2,525
Republic of Korea	50	81	93	143
United States	3,923	3,253	5,942	9,865
Total papers:	9,668			25,346

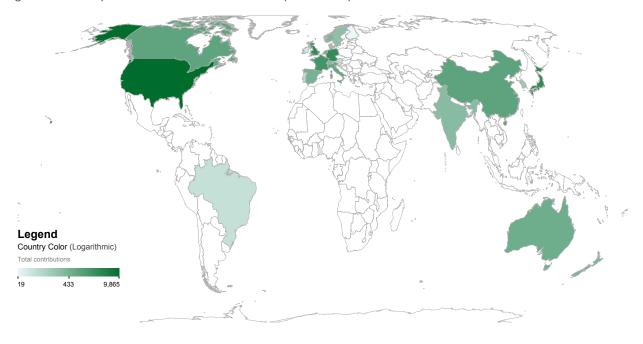
Table 3 expands on the first author column in the table above to show the breakdown of first author country or consortium affiliation for all non-Program publication types in the database. Note that theses and dissertations are underreported to AGI and are not fully represented.

Figures 5 and 6 show serial publications with all authors from member countries with the number of contributions on a logarithmic scale. Figure 5 shows all Program publications (1969–2018); Figure 6 shows publications from the Integrated Ocean Drilling Program and IODP only (2003–2018).

Table 3. First-authored non-Program publications by type and current funding consortium (1969–2018).

Member country			These	ons	
or consortia	Serials	Misc.	B.S.	M.S.	Ph.D.
Australia/New Zealand Consortium	310	417	4	6	3
Brazil	23	25	0	0	0
China	420	114	0	0	0
ECORD	4,073	4,514	14	17	104
India	173	46	0	3	3
Japan	696	747	0	0	0
Republic of Korea	50	53	0	0	0
United States	3,923	6,413	26	227	310
Totals:	9,668	12,329	44	253	420

Figure 5. Serials by authors from member countries (1969–2018).



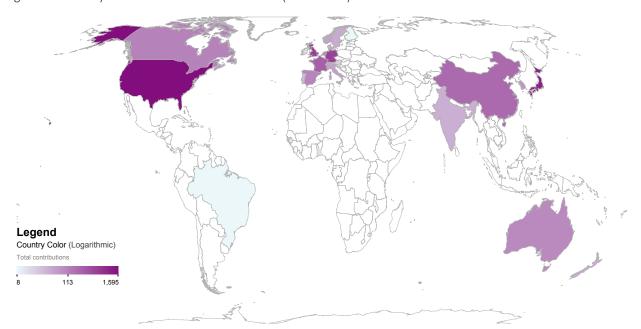


Figure 6. Serials by authors from member countries (2003–2018).

## Publications by expedition

Figure 7 shows Program (Expedition Reports, post-expedition research data reports, and *Scientific Drilling* papers) and non-Program serial publications for all completed Integrated Ocean Drilling Program and IODP expeditions whose Expedition Reports volumes published before the end of June 2018 (Expeditions 301–366 and 370). Note that the publication tail for postcruise expedition research in both Program and serial publications extends for several years after the end of the expedition; hence, more recent expeditions have fewer publications credited to them, as illustrated in the figure.

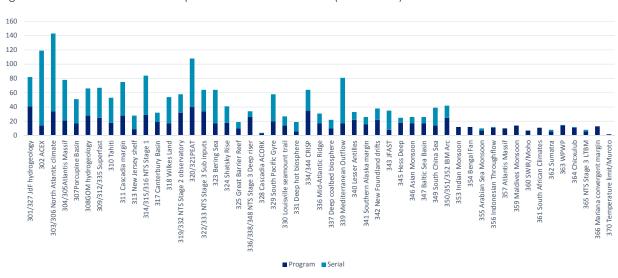


Figure 7. Publication records for Expeditions 301–366 and 370 (2003–2018).

# Publications by Science Plan theme

Figure 8 shows Program and non-Program (all types) records related to Integrated Ocean Drilling Program expeditions (Expeditions 301–348) and sorted by Integrated Ocean Drilling Program Initial Science Plan themes (2003–2013). Initial Science Plan themes are tied to the primary objectives of each expedition as listed in *Developments in Marine Geology 7: Earth and Life Processes Discovered from Subseafloor Environments (A Decade of Science Achieved by the Integrated Ocean Drilling Program [IODP]*).

- Deep Biosphere: Expeditions 301, 307, 308, 311, 327, 329–331, 334, 336, 337, and 344.
- Environmental Change, Processes and Effects: Expeditions 302, 303/306, 310, 313, 317, 318, 320/321, 323, 325, 339, 341, 342, 346, and 347.
- Solid Earth Cycles and Geodynamics: Expeditions 304/305, 309/312, 314/315/316, 319, 322, 324, 326, 332, 333, 335, 338, 340, 343, 345, and 348.



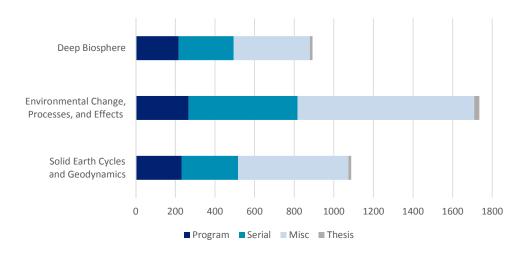


Figure 9 shows Program and non-Program (all types) serial, miscellaneous, and thesis/dissertation publication records related to IODP (Expeditions 349–366 and 370) and sorted by IODP Science Plan themes. Science plan themes are tied to the primary objectives of each expedition and were obtained from IODP Forum presentations.

- Biosphere Frontiers: Expeditions 357, 364, 366, and 370.
- Climate and Ocean Change: Expeditions 353–356, 359, 361, 363, and 364.
- Earth Connections: Deep Processes: Expeditions 349–352, 356, 357, and 360.
- Hazards on Human Timescales: Expeditions 357, 362, 365, and 366.

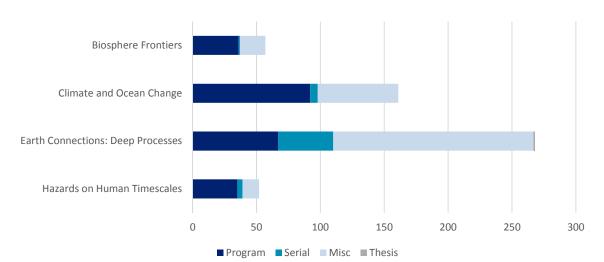
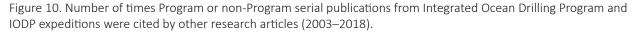
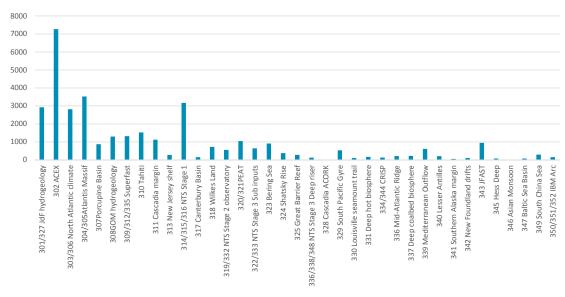


Figure 9. International Ocean Discovery Program publication records by Science Plan theme (2013–2018).

#### Cited-by statistics

As indexing and interconnectivity of scientific research results increase, we are better able to illustrate through "cited-by" data how often scientific publications are cited in other research articles. Cited-by data, in the form of number of times an article has been cited, can be accrued through several venues: Science Direct, SCOPUS, CrossRef, Web of Science, Web of Knowledge, and others. Comprehensive cited-by results are unavailable at this time, as not all publishers utilize cited-by data compilers. For this report, we collected cited-by data in July 2018 through Google Scholar. Review of these cited-by data shows that Program publications and non-Program serial publications containing research results from Integrated Ocean Drilling Program and IODP expeditions have been cited in other research articles more





than 34,900 times between 2003 and 2018. Figure 10 includes available cited-by counts for Expeditions 301–352.

Table 4 (see next page) lists the ODP, Integrated Ocean Drilling Program, and IODP expedition-related papers that have been most cited as of July 2018. As mentioned above, it takes several years for papers to be published, and even more time for them to build up a high cited-by number; all of the most-cited papers are related to volumes published in 2011 or before. All of them are published in the top journals by impact factor, as shown in Figure 4.

Altmetric scores demonstrate the more immediate impact of papers by tracking mentions of them by news outlets, blogs, Wikipedia pages, and other social media. Table 5 (see page 14) lists the DSDP, ODP, Integrated Ocean Drilling Program, and IODP expedition-related papers with the highest Altmetric scores as of September 2018. Again, all of them are published in the top journals by impact factor, as shown in Figure 4. Visit the Altmetric website for more information about Altmetric scores (<a href="https://www.altmetric.com">https://www.altmetric.com</a>).

In 2013, IODP instituted a web-based cited-by linking function that parses metadata from CrossRef's Cited-by Linking service to provide links from *Proceedings* table of contents pages to scientific articles or books that cite a Program publication. Cited-by results are continually updated (<a href="http://publications.iodp.org">http://publications.iodp.org</a>). Note that these cited-by results include cites only from publishers that participate in CrossRef cited-by linking services. Cited-by statistics and Altmetric scores for Program and non-Program publications can also be found at Science Open (<a href="http://ScienceOpen.com">http://ScienceOpen.com</a>).

## Customized reports

IODP funding agencies, implementing organizations, program member offices, and individual member countries may request customized reports that may include combinations of publication data organized by

- Country or consortia;
- Program (DSDP, ODP, Integrated Ocean Drilling Program, or IODP);
- Leg, expedition, complex science program, or geographic area;
- Publication year; or
- Specific serial publication.

To request a customized report, contact Citations@iodp.tamu.edu.

Table 4. Top cited expedition-related papers as of July 2018.

Article	Leg or expedition	Cited by (N)	Altmetric score	Altmetric link
Sluijs, A., Schouten, S., Pagani, M., Woltering, M., Brinkhuis, H., Sinninghe Damsté, J.S., Dickens, G.R., Huber, M., Reichart, GJ., Stein, R., Matthiessen, J., Lourens, L.J., Pedentchouk, N., Backman, J., Moran, K., and the Expedition 302 Scientists, 2006. Subtropical Arctic Ocean temperatures during the Palaeocene/ Eocene Thermal Maximum. <i>Nature</i> , 441(7093):610–613. http://dx.doi.org/10.1038/nature04668	IODP 302	550	41	https://www.altmetric.com/ details/117371
Inagaki, F., Nunoura, T., Nakagawa, S., Teske, A., Lever, M., Lauer, A., Suzuki, M., Takai, K., Delwiche, M., Colwell, F.S., Nealson, K.H., Horikoshi, K., D'Hondt, S., and Jørgensen, B.B., 2006. Biogeographical distribution and diversity of microbes in methane hydrate-bearing deep marine sediments on the Pacific Ocean margin. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 103(8):2815–2820. http://dx.doi.org/10.1073/pnas.0511033103	ODP 201, 204	549	9	https://www.altmetric.com/details/4593359
Moran, K., Backman, J., Brinkhuis, H., Clemens, S.C., Cronin, T., Dickens, G.R., Eynaud, F., Gattacceca, J., Jakobsson, M., Jordan, R.W., Kaminski, M., King, J., Koc, N., Krylov, A., Martinez, N., Matthiessen, J., McInroy, D., Moore, T.C., Onodera, J., O'Regan, M., Pälike, H., Rea, B., Rio, D., Sakamoto, T., Smith, D.C., Stein, R., St. John, K., Suto, I., Suzuki, N., Takahashi, K., Watanabe, M., Yamamoto, M., Farrell, J., Frank, M., Kubik, P., Jokat, W., and Kristoffersen, Y., 2006. The Cenozoic palaeoenvironment of the Arctic Ocean. <i>Nature</i> , 441(7093):601–605. http://dx.doi.org/10.1038/nature04800	IODP 302	513	25	https://www.altmetric.com/details/117368
Lipp, J.S., Morono, Y., Inagaki, F., and Hinrichs, KU., 2008. Significant contribution of Archaea to extant biomass in marine subsurface sediments. <i>Nature</i> , 454(7207):991–994. http://dx.doi.org/10.1038/nature07174	ODP 201, 204, 207; IODP 301, 311	475	4	https://www.altmetric.com/ details/526275
Scher, H.D., and Martin, E.E., 2006. Timing and climatic consequences of the opening of Drake Passage. <i>Science</i> , 312(5772):428–430. https://doi.org/10.1126/science.1120044	ODP Site 1090 and others	447	3	https://www.altmetric.com/ details/4212417
Kallmeyer, J., Pockalny, R., Adhikari, R.R., Smith, D.C., and D'Hondt, S., 2012. Global distribution of microbial abundance and biomass in subseafloor sediment. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 109(40):16213–16216. https://doi.org/10.1073/pnas.1203849109	IODP 323 with ODP 204, 204, 207, and IODP 301, 311, 336	411		Not available
Pagani, M., Pedentchouk, N., Huber, M., Sluijs, A., Schouten, S., Brinkhuis, H., Sinninghe Damsté, J.S., Dickens, G.R., and Expedition 302 Scientists, 2006. Arctic hydrology during global warming at the Palaeocene/Eocene Thermal Maximum. <i>Nature</i> , 443(7103):671–675. https://doi.org/10.1038/nature05043	IODP 302	326	15	https://www.altmetric.com/ details/117369
Deschamps, P., Durand, N., Bard, E., Hamelin, B., Camoin, G., Thomas, A.L., Henderson, G.M., Okuno, J., and Yokoyama, Y., 2012. Ice-sheet collapse and sea-level rise at the Bølling warming 14,600 years ago. <i>Nature</i> , 483(7391):559–564. http://dx.doi.org/10.1038/nature10902	IODP 310	313	63	https://www.altmetric.com/ details/671036
Moore, G.F., Bangs, N.L., Taira, A., Kuramoto, S., Pangborn, E., and Tobin, H.J., 2007. Three-dimensional splay fault geometry and implications for tsunami generation. <i>Science</i> , 318(5853):1128–1131. http://dx.doi.org/10.1126/science.1147195	IODP 314/315/316	308	11	https://www.altmetric.com/ details/1373810
Frost, B.R., and Beard, J.S., 2007. On silica activity and serpentinization. <i>Journal of Petrology</i> , 48(7):1351–1368. http://dx.doi.org/10.1093/petrology/egm021	IODP 304/305	276		Not available
	Total cited by:	4,168		

Table 5. Expedition-related papers with the highest Altmetric scores as of September 2018.

Article	Expedition	Altmetric score	Altmetric link
Morgan, J.V., Gulick, S.P.S., Bralower, T., Chenot, E., Christeson, G., Clayes, P., Cockell, C., et al., 2016. The formation of peak rings in large impact craters. <i>Science</i> , 354(6314):878–882. http://dx.doi.org/10.1126/science.aah6561	IODP 364	922	https://www.altmetric.com/ details/13758998
Sager, W.W., Zhang, J., Korenaga, J., Sano, T., Koppers, A.A.P., Widdowson, M., and Mahoney, J.J., 2013. An immense shield volcano within the Shatsky Rise oceanic plateau, northwest Pacific Ocean. <i>Nature Geoscience</i> , 6:976–981. http://dx.doi.org/10.1038/ngeo1934	IODP 324 with ODP 192 and 198	777	https://www.altmetric.com/ details/1732582
Artemieva, N., Morgan, J., and the Expedition 364 Science Party, 2017. Quantifying the release of climate-active gases by large meteorite impacts with a case study of Chicxulub: release of climate-active gases. <i>Geophysical Research Letters</i> , 44(20):10180–10188. https://doi.org/10.1002/2017GL074879	IODP 364	542	https://www.altmetric.com/ details/28144988
Vajda, V., Arz, A., Alegret, L., Rebolledo, M., Willumsen, P., Matsui, J.T., Deutsch, A., et al., 2010. The Chicxulub asteroid impact and mass extinction at the Cretaceous-Paleogene boundary. <i>Science</i> , 327(5970):1214–1218. https://doi.org/10.1126/science.1177265	ODP 207	495	https://www.altmetric.com/ details/103997
Gutjahr, M., Ridgwell, A., Sexton, P.F., Anagnostou, E., Pearson, P.N., Pälike, H., Norris, R.D., Thomas, E., and Foster, G.L., 2018. Very large release of mostly volcanic carbon during the Paleocene-Eocene Thermal Maximum. <i>Nature</i> , 548:573–577. https://doi.org/10.1038/nature23646	DSDP 48 with ODP 114	481	https://www.altmetric.com/ details/24534824
Lowery, C.M., Bralower, T.J., Owens, J.D., Rodríguez-Tovar, F.J., Jones, H., Smit, J., et al., 2018. Rapid recovery of life at ground zero of the end-Cretaceous mass extinction. <i>Nature</i> , 588:288–291. https://doi.org/10.1038/s41586-018-0163-6	IODP 364	464	https://www.altmetric.com/ details/43002567
Fulton, P.M., Brodsky, E.E., Kano, Y., Mori, J., Chester, F., Ishikawa, T., Harris, R.N., et al., 2013. Low coseismic friction on the Tohoku-oki fault determined from temperature measurements. <i>Science</i> , 342(6163)1214–1217. http://dx.doi.org/10.1126/science.1243641	IODP 343	343	https://www.altmetric.com/ details/1958870
Chester, F.M., Rowe, C., Ujiie, K., Kirkpatrick, J., Regalla, C., Remitti, F., Moore, J.C., et al., 2013. Structure and composition of the plate-boundary slip zone for the 2011 Tohoku-oki Earthquake. <i>Science</i> , 342(6163):1208–1211. http://dx.doi.org/10.1126/science.1243719	IODP 343	331	https://www.altmetric.com/ details/1958617
Ujiie, K., Tanaka, H., Saito, T., Tsutsumi, A., Mori, J.J., Kameda, J., Brodsky, E.E., et al., 2013. Low coseismic shear stress on the Tohoku-oki megathrust determined from laboratory experiments. <i>Science</i> , 342(6163):1211–1214. http://dx.doi.org/10.1126/science.1243485	IODP 343	280	https://www.altmetric.com/ details/1958880
Plümper, O., King, H.E., Geisler, T., Liu, Y., Pabst, S., Savov, I.P., Rost, D., and Zack, T., 2017. Subduction zone forearc serpentinites as incubators for deep microbial life. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 114(17):4324–4329. https://doi.org/10.1073/pnas.1612147114	ODP 125 and 195	229	https://www.altmetric.com/ details/18706811