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"Current Comments"

Journal Citation Studies. XI.
Journal of Geophysical Research

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Recently we listed heavily cited geological and geophysical journals.[1] The most cited was the *Journal of Geophysical Research (JGR)*, published by the American Geophysical Union. It was most cited not only by a special group of 37 geological and geophysical journals. It also ranked 37th among all journals in terms of total citations, and 87th in terms of impact.[2]

JGR is particularly interesting in its cited/citing relationships. In 1969 it was cited 14,284 times. A list of the 25 journals that cited it most often (80% of all citations of *JGR*) is given in Figure 1a. Twenty-five percent of the citations were self-citations. Figure 1b shows the 25 journals that were most cited by *JGR*. They account for only 30% of the references by *JGR* to other jour-

Figure 1a
Journals that Cited *J. Geophys. Res.*

	Times Citing	Journal Title
1.	3636	J. Geophys. Res.
2.	1400	Radio Science
3.	604	Space Sci. Rev.
4.	516	Earth Planet. Sci. Lett.
5.	504	Science
6.	496	Planet. Space Sci.
7.	484	Nature
8.	432	Rev. Geophys. Space Phys.
9.	372	Geophys. J. Roy. Astr. Soc.
10.	332	Ann. Geophysique
11.	316	B. Seismol. Soc. Amer.
12.	284	Geol. Soc. Amer. Bull.
13.	220	J. Atmosph. Terr. Phys.
14.	216	Solar Physics
15.	208	Geochim. Cosmochim. Acta
16.	176	J. Atmosph. Sci.
17.	172	Earth Sci. Rev.
18.	144	Rep. Ionosph. Space Res. Japan
19.	140	Aerospace Med.
20.	124	Canad. J. Physics
21.	120	Astrophys. J.
22.	120	Izv. Akad. Nauk SSSR Ser. Fiz.
23.	120	J. Plasma Phys.
24.	116	Canad. J. Earth Sci.
25.	112	Trans. Amer. Geophys. Union
	2920	All Other (169 Journals)
	14284	Total

Figure 1b
Journals that were Cited by *J. Geophys. Res.*

	Times Cited	Journal Title
1.	3636	J. Geophys. Res
2.	380	Science
3.	356	Planet. Space Sci.
4.	284	Trans. Amer. Geophys. Union
5.	276	Nature
6.	268	Bull. Seismol. Soc. Amer.
7.	232	Geochim. Cosmochim. Acta
8.	212	Canad. J. Physics
9.	184	Astrophys. J.
10.	172	Phys. Rev.
11.	168	J. Atmosph. Terr. Phys.
12.	140	Proc. Roy. Soc. London
13.	128	Geol. Soc. Amer. Bull.
14.	124	Phys. Fluids
15.	116	J. Atmosph. Sci.
16.	112	Rev. Geophys. Space Phys.
17.	104	Geophys. J. Roy. Astr. Soc.
18.	104	Tellus
19.	100	J. Chem. Phys.
20.	96	J. Appl. Phys.
21.	92	Ann. Geophysique
22.	76	Quart. J. Roy. Meteorol. Soc.
23.	72	Bull. Earthquake Res. I. T.
24.	72	Deep-Sea Res.
25.	72	Phys. Rev. Lett.
	17468	All Other (298 Journals)
	25044	Total

nals. Here the self-citation rate drops to 14%. Thus paradoxically there are two self-citation rates.[3]

In all *JGR* was cited by 194 source journals in 1969. It cited 323 publications, but these include some books, reports, theses, etc.

Like our previous study of geological and geophysical journals, this study of *JGR* alone again emphasizes the importance of *Science* and *Nature* for the research continuum that stretches from geology to astrogeophysics. Both of these multidisciplinary journals were among the first five most often cited by *JGR*. More significant, they were also among the first seven that cited *JGR* most frequently. The latter is particularly important as a demonstration of the 'geophysical' orientation of the two journals, and of the role played by multidisciplinary journals in specific areas of research. Undoubtedly the review quality of many articles in such journals increases the citation counts.

To round out our study of the *Journal of Geophysical Research*, Figure 2 provides a list of highly cited articles from *JGR*. All articles cited more than 70 times during the years 1961-1972 were included. The subject matter spans the continuum from chondrite chemistry and continental faults through magnetospheric ionization and the solar wind.

In contrast to a future listing of 'earth-bound' geology articles, most of the articles listed in Figure 2 were published in the 1960s. Only *one* paper, item 10, was published earlier, in 1952, a review article of 60 pages on the elasticity and constitution of the earth's interior. Item 30 is the only paper from the 70s. It deals with the new global tectonics. It is noteworthy, however, that the top four articles were published as recently as 1968. Further, in 1973 the first, LePichon's article on continental drift, was cited an additional 75 times by 26 different journals, while the second, the review by Isacks *et al.* of seismology and the new global tectonics, was cited 73 times in 1973 by 18 different journals.

1. Garfield, E. Journal Citation Studies. X. Geology and geophysics. *Current Contents® (CC®)* No. 30, 24 July 1974, p. 5-9.
2. ————. Citation analysis as a tool in journal evaluation. *Science* 178:471-79, 1972. Reprinted in *CC* No. 6, 7 February 1973, p. 5-24.
3. If this puzzles you, you're not alone. We'll expand on this point some other time.

Figure 2. Highly Cited Articles from *J. Geophys. Res.*

Rank	Times Cited 1961-72	Bibliographical Data
1.	365	LePichon X. Sea-floor spreading and continental drift. *J. Geophys. Res.* 73:3661-90, 1968.
2.	330	Isacks B, Oliver J & Sykes L R. Seismology and the new global tectonics. *J. Geophys. Res.* 73:5855-99, 1968.
3.	290	Heirtzler J R, Dickson G O, Herron E M, Pitman W C III & LePichon X. Marine magnetic anomalies, geomagnetic field reversals and motions of the ocean floor and continents. *J. Geophys. Res.* 73:2119-36, 1968.
4.	278	Morgan W J. Rises, trenches, great faults, and crustal blocks. *J. Geophys. Res.* 73:1959-82, 1968.
5.	240	Ness N F, Scearce C S & Seek J B. Initial results of the Imp 1 magnetic field experiment. *J. Geophys. Res.* 69:3531-69, 1964.
6.	213	McIlwain C E. Coordinates for mapping the distribution of magnetically trapped particles. *J. Geophys. Res.* 66:3681-91, 1961.
7.	194	Kennel C F & Petschek H E. Limit on stably trapped particle fluxes. *J. Geophys. Res.* 71:1-28, 1966.
8.	186	Carpenter D L. Whistler studies of the plasmapause in the magnetosphere. I. Temporal variations in the position of the knee and some evidence on plasma motions near the knee. *J. Geophys. Res.* 71:693-710, 1966.
9.	184	Ness N F. The earth's magnetic tail. *J. Geophys. Res.* 70:2898-3006, 1965.
10.	183	Birch F. Elasticity and constitution of the earth's interior. *J. Geophys. Res.* 57:227-86, 1952.

11.	151	**Sykes L R.** Mechanism of earthquakes and nature of faulting on the mid-oceanic ridges. *J. Geophys. Res.* 72:2131-53, 1967.
12.	124	**Farley D T.** A plasma instability resulting in field-aligned irregularities in the ionosphere. *J. Geophys. Res.* 68:6083-97, 1963.
13.	124	**Jensen D C & Cain J C.** An interim geomagnetic field, *J. Geophys. Res.* 67:3568, 1962.
14.	121	**Williams D J & Mead G.** Nightside magnetosphere configuration as obtained from trapped electrons at 1100 kilometers. *J. Geophys. Res.* 70: 3017-30, 1965.
15.	119	**Axford W I, Petschek H E & Siscoe G L.** Tail of the magnetosphere. *J. Geophys. Res.* 70:1231-37, 1965.
16.	113	**O'Brien B J.** High-latitude geophysical studies with satellite Injun 3. 3. Precipitation of electrons into the atmosphere. *J. Geophys. Res.* 69:13-44, 1964.
17.	111	**Frank L A.** On the extraterrestrial ring current during geomagnetic storms. *J. Geophys. Res.* 72:3753-67, 1967.
18.	108	**Oliver J & Isacks B.** Deep earthquake zones, anomalous structures in the upper mantle, and the lithosphere. *J. Geophys Res.* 72:4259-75, 1967.
19.	107	**Cahill L J & Amazeen P G.** The boundary of the geomagnetic field. *J. Geophys. Res.* 68:1835-43, 1963.
20.	107	**Heppner J P, Sugiura M, Skillman T L, Ledley B G & Campbell M.** OGO-A magnetic field observations. *J. Geophys. Res.* 72:5417-71, 1967.
21.	107	**Nicolet M & Aikin A C.** The formation of the D region of the ionosphere. *J. Geophys. Res.* 65:1469-83, 1960.
22.	105	**Carpenter D L.** Whistler evidence of a 'knee' in the magnetospheric ionization density profile. *J. Geophys. Res.* 68:1675-82, 1963.
23.	103	**Muldrew D B.** F-layer ionization troughs deduced from Alouette data. *J. Geophys. Res.* 70:2635-50, 1965.
24.	99	**Vasyliunas V M.** A survey of low-energy electrons in the evening sector of the magnetosphere with OGO-1 and OGO-3. *J. Geophys. Res.* 73:2839-84, 1968.
25.	98	**Sen H K & Wyller A A.** On the generalization of the Appleton-Hartee magnetoionic formulas. *J. Geophys. Res.* 65:3931-50, 1960.
26.	98	**Rowe M W & Kuroda P K.** Fissiogenic xenon from the Pasamonte meteorite. *J. Geophys. Res.* 7:709-14, 1965.
27.	97	**Neugebauer M & Snyder C W.** Mariner 2 observations of the solar wind. 1. Average properties. *J. Geophys. Res.* 71:4469-84, 1966.
28.	95	**Sykes L R.** The seismicity and deep structure of island arcs. *J. Geophys. Res.* 71:2981-3006, 1966.
29.	94	**LePichon X & Heirtzler J R.** Magnetic anomalies in the Indian Ocean and sea-floor spreading. *J. Geophys. Res.* 73:2101-17, 1968.
30.	92	**Dewey J F & Bird J M.** Mountain belts and the new global tectonics. *J. Geophys. Res.* 75:2625-47, 1970.
31.	90	**Freier P S & Webber W R.** Exponential rigidity spectrums for solar-flare cosmic rays. *J. Geophys. Res.* 68:1605-29, 1963.
32.	90	**Nishida A.** Formation of plasmapause, or magnetospheric plasma knee, by the combined action of magnetospheric convection and plasma escape from the tail. *J. Geophys. Res.* 71:5669-80, 1966.
33.	87	**Bame S J, Asbridge J R, Felthauser H E, Hones E W & Strong I B.** Characteristics of the plasma sheet in the earth's magnetotail. *J. Geophys. Res.* 72:113-30, 1967.
34.	85	**Spencer N W, Brace L H, Larigan G R, Taeusch G R & Nieman H.** Electron and molecular nitrogen temperature and density in the thermosphere. *J. Geophys. Res.* 70:2665-98, 1965.
35.	84	**Freeman J W.** The morphology of the electron distribution in the outer radiation zone and near the magnetospheric boundary as observed by Explorer 12. *J. Geophys. Res.* 69:1691-1725, 1964.
36.	84	**Ness N F, Behannon K W, Scearce C S & Cantarano S C.** Early results from the magnetic field experiment on Lunar Explorer 35. *J. Geophys. Res.* 72:5769-78, 1967.
37.	79	**Frank L A.** A survey of electrons $>$ 40 KEV beyond 5 earth radii with Explorer 14. *J. Geophys. Res.* 70:1593-1626, 1965.
38.	77	**Axford, W I.** The interaction between the solar wind and the earth's magnetosphere. *J. Geophys. Res.* 67:3791, 1962.

39. 76 Pitman W C III, Herron E M & Heirtzler J R. Magnetic anomalies in the Pacific and sea-floor spreading, *J. Geophys. Res.* 73:2069-85, 1968.
40. 75 Coleman P J. Variations in the interplanetary magnetic field: Mariner 2. I. Observed properties. *J. Geophys. Res.* 71:5509-32, 1966.
41. 75 Holzer R E, McLeod M G & Smith E J. Preliminary results from the OGO-1 search coil magnetometer: boundary positions and magnetic noise spectra. *J. Geophys. Res.* 71:1481-86, 1966.
42. 75 Johnson L R. Array measurements of P velocities in the upper mantle. *J. Geophys. Res.* 72:6309-25, 1967.
43. 75 Talwani M, LePichon X & Ewing M. Crustal structure of mid-ocean ridges. 2. Computed model from gravity and seismic refraction data. *J. Geophys. Res.* 70:341-52, 1965.
44. 74 Narcisi R S & Bailey A D. Mass spectrometric measurements of positive ions at altitudes from 64 to 112 kilometers. *J. Geophys. Res.* 70:3687-3700, 1965.
45. 74 Wolfe J H, Silva R W & Myers M A. Observation of the solar wind during the flight of Imp 1. *J. Geophys. Res.* 71:1319, 1966.
46. 76 Brune J N. Seismic moment, seismicity, and rate of slip among major fault zones. *J. Geophys. Res.* 73:777-84. 1968.
47. 76 Ferguson E E, Fehsenfeld F C, Goldan P D & Schmeltekopf A L. Positive ion-neutral reactions in the ionosphere. *J. Geophys. Res.* 70:4323-30, 1965.
48. 74 Taylor H E & Hones E W. Adiabatic motion of auroral particles in a model of the electric and magnetic fields. *J. Geophys. Res.* 70:3605-28, 1965.
49. 71 Anderson K A, Harris H K & Paoli R J. Energetic electron fluxes in and beyond the earth's outer magnetosphere. *J. Geophys. Res.* 70:1039-50, 1965.
50. 71 Gast P W. Limitations on the composition of the upper mantle. *J. Geophys. Res.* 65:1287-97, 1960.
51. 71 Keil K & Fredriksson K. The iron, magnesium and calcium distribution in coexisting olivines and rhombic pyroxenes of chondrites. *J. Geophys. Res.* 69:3487-3516, 1964.
52. 71 Kennedy G C & Lamori P N. The pressures of some solid-solid transitions. *J. Geophys. Res.* 67:851-56, 1962.