

SAGE Annual Report

Publications: (major publications resulting from the work under the award)

IRIS, a university research consortium dedicated to exploring the Earth's interior and earthquake processes through the collection and distribution of seismological data, plays an important supporting role in scientific research, reflected through citations in publications of research papers and abstracts. IRIS's existing database of publications based on the use of IRIS resources now has more than 10,300 entries.

IRIS has been tracking citations in 11 traditional journals since 2000. In order to maintain continuity while searching journals and procuring citations, the processes and procedures used in previous years were followed as closely as possible and improved upon where applicable. These procedures and data findings are outlined below.

Citations Summary – Calendar Year 2020

Between January 1, 2020 and December 31, 2020, there were 1,180 references to IRIS-related data or products in published scientific literature. This includes 686 references in top journals (Top 11 and 26 others), 194 references in additional journals and books, 167 references in conference proceedings or abstracts, 44 references in theses, and an additional 89 citations that reference specific stations in or resources related to the Global Seismographic Network.

Introduction

The aim of this year's project was to continue the 21-year compilation of IRIS-related citations into one database. In order to maintain continuity while searching journals and procuring citations, the processes and procedures used in previous years were followed as closely as possible and improved upon where applicable. These procedures and data findings are outlined below.

Searching for IRIS Citations from 2020

The 11 most prominent earth science journals were given priority while searching. These journals are:

- *Bulletin of Seismological Society of America (BSSA)*
- *Journal of Geophysical Research (JGR)*
- *Geophysical Journal International (GJI)*
- *Seismological Research Letters (SRL)*
- *Geophysical Research Letters (GRL)*
- *Earth and Planetary Science Letters (EPSL)*
- *Physics of the Earth and Planetary Interior (PEPI)*
- *Tectonophysics (TP)*
- *Nature and related journals*
- *Science and related journals*
- *Geology*

The journals were searched for the following key words:

- *IRIS*
- *Incorporated Research Institutions for Seismology*
- *PASSCAL*
- *DMC*
- *DMS*
- *Data Management Center*
- *Global Seismographic Network (and Global Seismic Network)*
- *GSN*
- *GDSN*
- *SCARDEC*
- *USArray*
- *EarthScope*
- *Transportable Array (TA)*
- *Magnetotellurics*
- *Flexible Array*
- *Greenland Ice Sheet Monitoring Network (GLISN)*
- *www.iris.edu*

All searches were carried out electronically with different search engines for journals as follows:

- *Journal of Geophysical Research* and *Geophysical Research Letters* were searched using the Wiley search engine.
- *Geophysical Journal International* was searched with the search engine for the journal.
- For Seismological Society of America publications (*Bulletin of Seismological Society of America*, *Seismological Research Letters*), the GeoScienceWorld search engine was used.
- For Elsevier publications, *Earth and Planetary Science Letters*, *Physics of the Earth and Planetary Interiors*, and *Tectonophysics*, the ScienceDirect engine was used.
- *Nature* and *Science* have their own search engines on their respective web pages.
- For the Geological Society of America publication, *Geology*, the GeoScienceWorld engine was used.

Most of these search engines are capable of an all-text search, which often brings up unrelated documents as well as the intended IRIS research results. In order to cull unrelated references, the initial search results were individually examined, and the unrelated entries were deleted. For the remaining documents, a manual “find” function was performed for the appropriate keyword in the abstract, primary text, figures, funding sources and/or acknowledgements. If the document was relevant, it was marked and exported into the database as a .ris file.

The distribution of findings are as follows:

Table 1. Total number of citations in the Top 11 journals.

No.	Journal	Jan 2020 - Dec 2020
1	Bulletin of the Seismological Society of America	61
2	Journal of Geophysical Research	125
3	Geophysical Journal International	84
4	Geophysical Research Letters	69
5	Earth and Planetary Science Letters	28
6	Seismological Research Letters	119
7	Physics of the Earth and Planetary Interiors	18
8	Tectonophysics	17
9	Science	11
10	Nature	30
11	Geology	7
	TOTAL	569

Beginning in 2019, citations in the journals “*Nature GeoScience*”, “*Nature Communications*” and “*Scientific Reports*” under the journal “*Nature*” were included as well as “*Science Advances*” under the journal “*Science*”. Previously, these citations were included in the “other important journals” category.

There was an increase in the total number of citations found in these journals in 2020 compared to calendar year 2019 – there were 454 citations in 2019 and 569 citations in 2020. Since the inception of the IRIS citations database in 2000, the number of IRIS-related citations in these journals has typically increased (Figure 1).

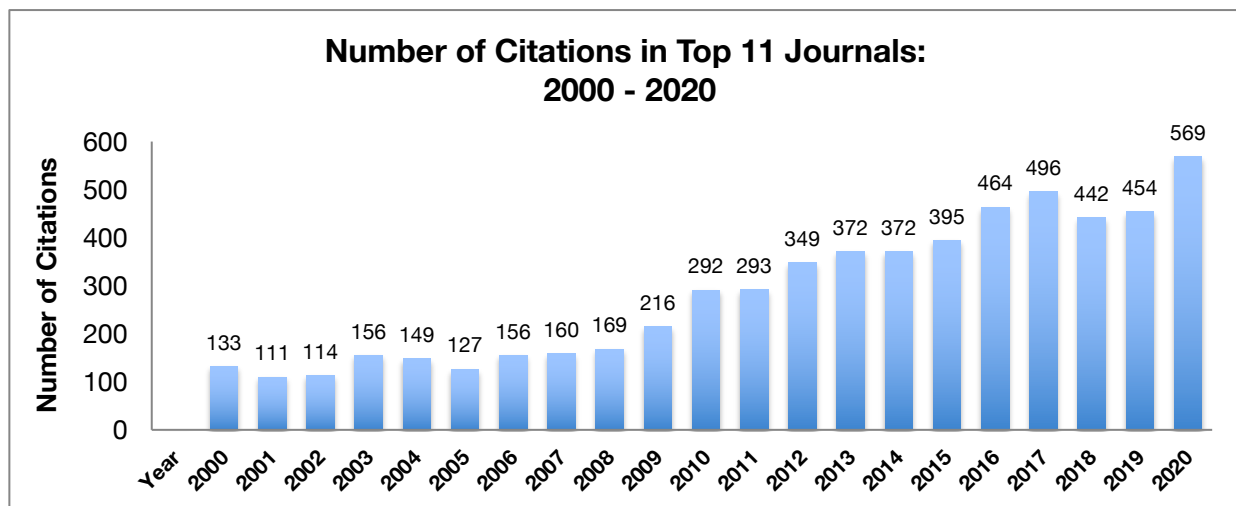


Figure 1. Total number of IRIS-related citations in the 11 most prominent earth science journals since the inception of the database in 2000. The number above each bar is the total number of citations in the Top 11 journals for that year.

This year, there were more IRIS-related publications in *BSSA*, *JGR*, *GRL*, *SRL*, *Science*, *Nature* and *Geology* (12, 21, 14, 67, 4, 10 and 2 more references, respectively), but there were fewer

IRIS-related publications in *GJI*, *EPSL*, and *TP* (4, 5 and 6 less, respectively). The number of publications in *PEPI* remained the same. Refer to Figure 2 to see a direct comparison of the number of citations in each journal for the last two calendar years.

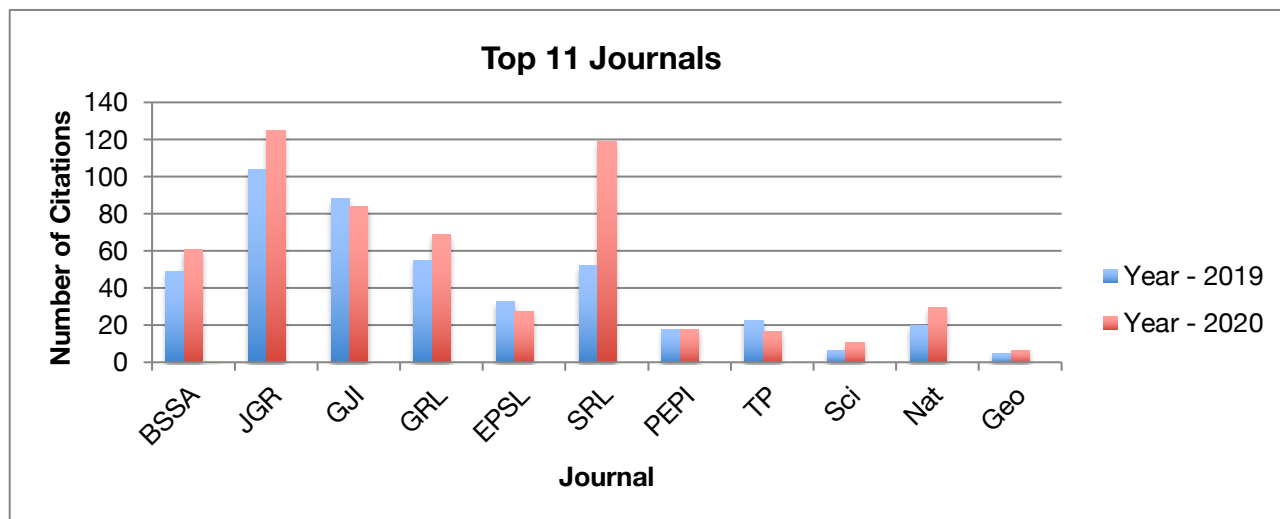


Figure 2. Number of publications in the Top 11 journals during calendar years 2019 and 2020.

The number of search terms found in each of the Top 11 journals is presented in Table 2. It is broken down by search term and individual journal. Some terms, such as “Global Seismographic Network” and “Global Seismic Network,” were searched by the proper term as well as by a commonly used, but incorrect, variation.

Table 2. Number of search terms in the Top 11 journals.

Search Term	Journal										
	JGI	JGR	Geology	GRL	SRL	BSSA	PEPI	TP	EPSL	Science	Nature
<i>IRIS</i>	70	117	6	65	102	52	14	13	22	15	21
<i>Incorporated Research Institutions for Seismology</i>	33	46	4	27	105	48	8	8	13	9	9
<i>PASSCAL</i>	7	9	2	5	15	3	3	3	3	2	1
<i>DMC</i>	25	62	2	28	55	13	5	5	10	7	10
<i>DMS</i>	1	3	0	2	2	3	0	1	1	1	0
<i>Data Management Center</i>	40	66	5	37	83	30	7	8	13	5	8
<i>GSN</i>	14	4	0	3	12	4	3	4	2	1	0
<i>Global Seismographic Network</i>	20	1	0	4	16	5	2	1	2	1	2
<i>Global Seismic Network</i>	2	0	0	2	10	4	2	1	1	1	2
<i>GDSN</i>	1	32	0	0	0	0	0	1	0	0	0
<i>USArray</i>	21	31	3	10	21	9	5	3	6	0	1
<i>EarthScope</i>	17	31	1	7	35	10	4	3	7	2	2

<i>Transportable Array</i>	15	2	2	8	36	10	4	1	7	1	1
<i>Magnetotellurics</i>	1	5	0	1	2	0	0	2	0	0	0
<i>Flexible Array</i>	2	3	0	1	5	2	0	1	1	0	0
<i>GLISN</i>	0	4	0	0	0	0	0	0	0	0	0
<i>Greenland Ice Sheet Monitoring Network</i>	0	22	0	0	0	0	0	0	0	0	0
<i>www.iris.edu</i>	11	0	2	7	15	16	3	3	0	2	4
<i>SCARDEC</i>	3	0	0	0	2	2	0	0	1	0	1
TOTAL	283	444	27	207	516	211	60	58	89	47	61

Searching for IRIS Citations in Other Important Earth Science Journals

IRIS promotes continuous conducting of geophysical investigations of seismic sources and Earth properties through its facilities and allows free and unrestricted access to its seismic database, which is one of the largest in the world. Researchers around the world use the IRIS database to explore the lithosphere, cryosphere, atmosphere, hydrosphere and deep Earth in unprecedented ways. The types of scientific findings aided by IRIS facilities are extremely varied, and this is reflected in the number and type of journals that cite IRIS data, instruments and facilities. Given the importance of some of these journals, their impact factor and effectiveness citation index, 26 other Earth science publications were selected for expanding the search for IRIS-related citations. These journals are:

- *Canadian Journal of Earth Sciences*
- *Geophysics*
- *The Leading Edge*
- *Reviews of Geophysics*
- *Tectonics*
- *Polar Science*
- *Journal of Glaciology*
- *Marine Geophysical Research*
- *Lithosphere*
- *Journal of Geodynamics*
- *Geosphere*
- *Journal of Volcanology and Seismology*
- *Seismic Instruments*
- *Natural Hazards and Earth System Sciences*
- *Journal of Structural Geology*
- *Natural Hazards*
- *Geochemistry, Geophysics, Geosystems*
- *Soil Dynamics and Earthquake Engineering*
- *Russian Journal of Pacific Geology*
- *Journal of Volcanology and Geothermal Research*
- *Marine Geology*
- *Geomorphology*
- *Pure and Applied Geophysics*
- *Chinese Journal of Geophysics*
- *Journal of Seismology*
- *EOS*

Note: Due to changes in publishing since the 2019 report, three of the previously searched other journals have been removed from the list.

- *Earth Surface* is part of the Top 11 journal *Journal of Geophysical Research*.
- *Nature Geoscience/Nature Communication* was combined with the Top 11 journal *Nature*.
- *Journal of Earthquake Science* is no longer published and was removed.

The number of citations for each of these other important journals for the calendar years 2015 - 2020 are presented in Table 3.

Table 3. Number of citations found in 26 other important journals.

Journal	2015	2016	2017	2018	2019	2020
Canadian Journal of Earth Sciences	1	3	1	3	0	0
Geophysics	1	10	1	1	1	3
The Leading Edge	0	1	1	2	0	1
Reviews of Geophysics	4	2	2	0	1	1
Tectonics	4	3	7	5	7	14
Polar Science	0	0	0	2	0	1
Journal of Glaciology	0	0	1	2	0	3
Marine Geophysical Research	1	0	4	0	0	2
Lithosphere	2	0	8	3	2	1
Journal of Geodynamics	4	3	1	3	3	1
Geosphere	3	7	7	8	9	0
Journal of Volcanology and Seismology	0	0	1	1	2	2
Seismic Instruments	0	0	2	4	4	3
Natural Hazards and Earth System Sciences	0	1	0	1	0	2
Journal of Structural Geology	5	2	0	0	0	0
Natural Hazards	4	1	1	1	3	5
Geochemistry, Geophysics, Geosystems	28	22	12	21	33	34
Soil Dynamics and Earthquake Engineering	0	2	1	5	0	0
Russian Journal of Pacific Geology	0	0	0	3	0	0
Journal of Volcanology and Geothermal Research	8	3	2	7	4	3
Marine Geology	2	0	0	1	0	0
Geomorphology	1	0	0	0	1	0
Pure and Applied Geophysics	12	9	4	13	16	30
Chinese Journal of Geophysics	0	6	5	2	0	1
Journal of Seismology	0	2	3	13	11	4
EOS	4	0	0	5	8	6
All 26 Journals	88	85	68	119	105	117

The total number of citations found in these journals in 2020 is higher than what was found the previous year (Figure 2) and most past years. In particular, there were more IRIS-related citations in the journals *Geochemistry*, *Geophysics*, *Geosystems*; *Tectonics*; and *Pure and Applied Geophysics*.

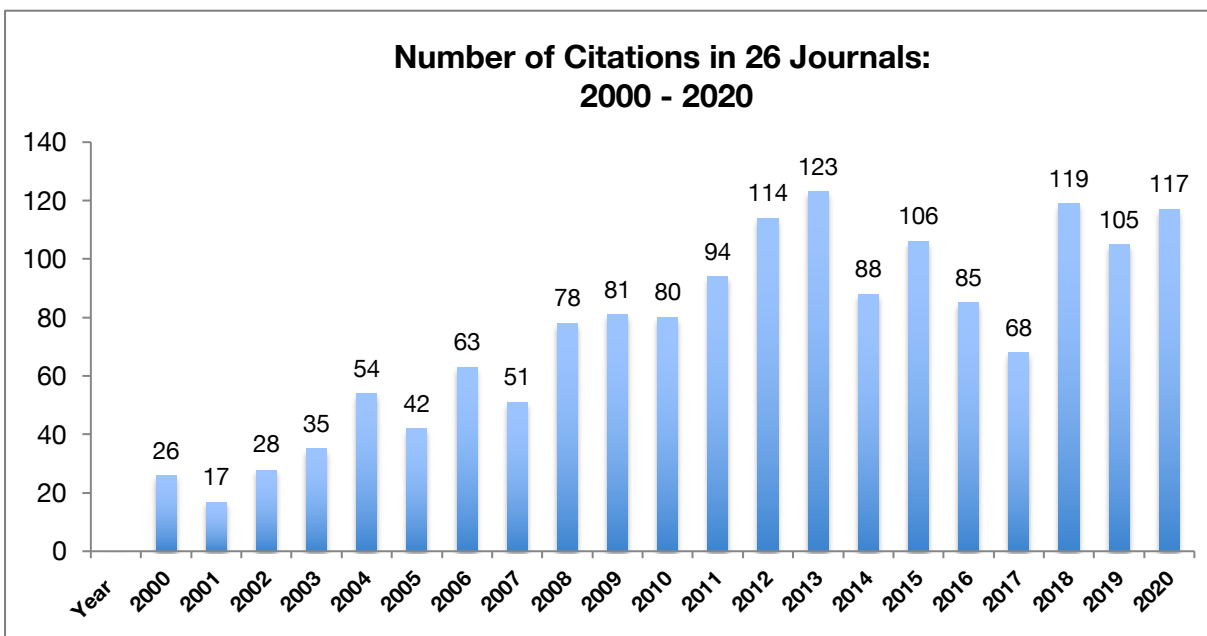


Figure 3. Graph showing the number of citations per year in the 26 other important journals. The number above each bar is the number of citations for that year.

Searching for IRIS Citations in Other Journals

As the application of IRIS facilities expands into new realms (e.g. rapid response, distributed acoustic sensing, and weather-related applications), citations in journals that were previously not relevant to IRIS-related research are expected. Additionally, unexpected and novel uses of the data and facilities are creating an exciting body of work outside of the traditional earth science journals. Books where IRIS data were used are also included in this section and are marked as such.

In order to explore the use of IRIS data and products in journals and books outside of the traditional earth science sphere and to show the breadth of the data usage, a generalized search was done on the aforementioned search terms using Google Scholar and Web of Science. This functionality became possible for IRIS in 2014. Each year, this search uncovers more journals that did not previously feature IRIS-related research, demonstrating the diverse applications of the data collected and provided by IRIS facilities. It is important to note that citations are not found in every journal every year. Additionally, if a journal is no longer published, it will be removed from the list.

These journals cover a diverse range of subjects, including acoustics and radio, engineering, computer science, law, planetary science, meteorology, marine science, petroleum geology, and education. These journals and the number of citations from each journal in 2014 - 2020 are listed in Table 4. In 2020, there were 179 articles in these journals or books that cited IRIS data, facilities or research. This is an increase of 34 citations over 2019.

Table 4. Additional journals and total number of IRIS-related citations in each.

Other Journals	2014	2015	2016	2017	2018	2019	2020
Journal of South American Earth Sciences	4	12	6	0	0	1	5
Computers & Geosciences	1	1	3	2	1	0	3
Surveys in Geophysics	2	2	0	0	1	0	0
Geotectonics	1	0	0	0	0	0	1
EURASIP Journal on Applied Signal Processing	1	0	0	0	0	0	0
Journal of the Acoustical Society of America	1	1	1	1	0	2	2
Physical Review Letters	1	0	0	0	0	0	0
Geomagnetism and Aeronomy	1	1	0	0	0	0	0
Journal of Applied Physics	1	0	0	0	0	0	0
Journal of African Earth Sciences	1	0	1	2	1	3	3
Physics Today	1	0	0	0	0	0	1
Meteoritics and Planetary Science	1	0	0	0	0	0	0
Progress in Earth and Planetary Science C7 - 10	1	1	0	0	1	1	0
Journal of Asian Earth Sciences	5	3	6	10	3	3	6
Journal of Geodesy	1	1	0	0	0	2	0
International Journal of Biometeorology	1	0	0	0	0	0	0
Izvestiya, Physics of the Solid Earth	5	5	2	4	3	6	8
IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing	1	0	0	0	0	1	0
Water Resources Research	1	0	0	0	0	1	0
Geological Society of America Special Papers	1	2	2	0	0	0	0
Geofísica Internacional	1	1	0	1	1	0	1
Earth, Planets, and Space	4	2	5	4	3	8	7
Journal of Applied Meteorology and Climatology	1	0	0	0	0	0	0
Advances in Geophysics (book)	1	0	0	0	0	0	1
Annual Review of Earth and Planetary Sciences	1	0	0	1	1	0	2
Doklady Earth Sciences	2	0	0	2	2	4	2
Journal of Hydrology	1	0	0	0	0	0	0
Oceanography	1	1	7	0	0	0	1
Cryosphere Discussions	1	0	0	0	0	0	0
Global and Planetary Change	1	0	0	0	0	0	0
Annual Review of Marine Science	1	0	0	0	0	0	0

Advances in Space Research	1	1	1	0	1	0	0
Geodesy and Geodynamics	1	1	1	3	0	0	0
Science China Earth Sciences	2	2	0	1	4	2	4
Radio Science	2	0	0	0	0	0	0
Acta Geologica Sinica	0	1	1	0	0	10	0
Modeling Earth Systems and Environment	0	0	1	0	0	0	0
Physics and Chemistry of the Earth	0	1	3	0	0	0	0
Arabian Journal of Geosciences	0	1	1	2	2	0	2
Physica A: Statistical Mechanics and its Applications	0	0	1	1	0	1	1
Precambrian Research	0	2	3	0	0	1	3
Earth and Space Science	0	0	1	1	0	0	2
Space Weather	0	0	2	10	3	2	5
The Science Teacher	0	0	1	0	0	0	0
Geoscience Letters	0	0	1	0	0	1	2
Ore Geology Reviews	0	0	1	0	0	1	0
Acta Geophysica	0	1	2	0	2	2	0
Gondwana Research	0	3	2	2	0	1	1
Rock Mechanics and Rock Engineering	0	0	1	0	0	0	0
Remote Sensing of Environment	0	0	2	1	1	0	0
Exploration Geophysics	0	0	1	0	0	1	0
International Journal of Disaster Risk Reduction	0	2	1	0	0	0	0
Field Guides	0	0	1	0	0	0	0
Journal of Natural Gas Science and Engineering	0	0	1	0	0	0	0
Science China Technological Sciences	0	0	1	0	0	0	0
Ain Shams Engineering Journal	0	0	1	0	0	0	0
International Journal of New Technology and Research (IJNTR)	0	0	1	0	0	0	0
Earthquake Spectra	0	0	3	3	1	1	0
Structural Control and Health Monitoring	0	0	1	0	0	0	0
Neural Computing and Applications	0	0	1	1	0	0	0
Geoscientific Instrumentation, Methods and Data Systems	0	0	1	0	0	0	0
South African Journal of Geology	0	0	1	0	0	0	0
Wiley Interdisciplinary Reviews: Water	0	0	1	0	0	0	0
Photogrammetric Engineering & Remote Sensing	0	0	1	0	0	0	0
Elements	0	0	2	0	0	0	0
Acta Geodaetica et Geophysica	0	0	2	2	0	0	1

Journal of the Association for Information Science and Technology	0	0	1	1	0	0	0
Spatial and Spatio-temporal Epidemiology	0	0	1	0	0	0	0
Advances in Geosciences	0	2	1	0	0	0	0
Physics Letters A	0	0	1	0	0	0	0
Interpretation	0	0	3	1	1	1	2
Flow Measurement and Instrumentation	0	0	1	0	0	0	0
Earth Surface Processes and Landforms	0	0	1	0	0	1	0
International Journal of Earth Sciences	0	0	2	2	0	0	3
Engineering Geology	0	1	1	0	0	0	1
International Journal of Human-Computer Studies	0	0	1	0	0	0	0
Geological Journal	0	0	2	0	2	1	0
Italian Journal of Geosciences	0	1	1	0	0	0	0
Geological Society, London, Special Publications	0	0	1	0	0	4	1
Physics of Wave Phenomena	0	0	1	0	0	0	0
Nonproliferation Review	0	0	1	0	0	0	0
Physics Reports	0	0	1	0	0	0	0
Marine Technology Society Journal	0	0	2	0	0	0	0
Monthly Weather Review	0	1	1	1	0	0	0
Journal of Petroleum Science and Engineering	0	0	1	1	0	0	0
Bulletin of the American Meteorological Society	0	1	1	0	0	0	0
International Journal of Greenhouse Gas Control	0	1	2	0	1	0	0
Geological Society of America Bulletin	0	0	2	3	0	0	0
Journal of Navigation	0	0	1	0	0	0	0
American Meteorological Society	0	0	1	0	0	0	0
Elementa: Science of the Anthropocene	0	0	1	0	0	0	0
Journal of Environmental and Engineering Geophysics	0	1	1	1	0	0	0
Journal of Applied Geophysics	0	1	2	2	0	0	3
Journal of the Geological Society	0	0	1	0	0	0	0
Materials Science and Engineering: A	0	0	1	0	0	0	0
International Journal of Ocean and Climate Systems	0	0	1	0	0	0	0
Journal of the Royal Statistical Society: Series C (Applied Statistics)	0	0	1	0	0	0	0
Annales Geophysicae	0	0	1	0	0	0	0
Geoscience Data Journal	0	0	1	0	0	0	0
Geofluids	0	0	1	0	0	0	0

Journal of Micromechanics and Microengineering	0	0	1	0	0	0	0
Journal of Atmospheric and Solar-Terrestrial Physics	0	1	0	0	0	0	0
Marine and Petroleum Geology	0	1	0	0	0	0	1
Cuadernos de Geografia (Geography Notebooks)	0	1	0	0	0	0	0
Earth Science Informatics	0	1	0	0	1	0	0
Earth Science Reviews	0	2	1	2	0	1	1
International Journal of Law, Crimes and Justice	0	1	0	0	0	0	0
AAPG Bulletin	0	1	0	0	0	0	0
Knowledge Based Systems	0	1	0	0	0	0	0
Geoscience Frontiers	0	2	0	0	0	1	0
Engineering Structures	0	1	0	0	0	0	0
Science of Tsunami Hazards	0	1	0	0	0	0	2
Icarus	0	1	0	0	1	0	1
Geosciences Journal	0	2	0	0	0	0	0
Contributions to Geophysics and Geodesy	0	1	0	0	0	0	0
Polish Polar Research	0	1	0	0	0	0	1
NRIAG Journal of Astronomy and Geophysics	0	1	0	1	0	0	0
Ocean Modelling	0	0	0	1	0	0	0
Advanced Science Letters	0	0	0	1	0	0	0
Computing in Science and Engineering	0	0	0	1	0	0	0
Space Science Reviews	0	0	0	2	2	3	1
Journal of Ocean Engineering and Science	0	0	0	1	0	0	0
Turkish Journal of Earth Sciences	0	0	0	2	0	0	0
Bulletin of Volcanology	0	0	0	1	0	3	6
CESifo Economic Studies	0	0	0	1	0	0	0
Solid Earth	0	0	2	1	1	6	5
Statistical Analysis and Data Mining: The ASA Data Science Journal	0	0	0	1	0	0	0
Granja-Revista de Ciencias de la vida	0	0	0	1	0	0	0
European Physical Journal Special Topics	0	0	0	1	0	0	0
Journal of Geoscience and Environment Protection	0	0	0	1	0	0	0
Frontiers in Earth Science	0	0	0	1	1	0	8
Signal Processing	0	0	0	1	0	0	0
Energy Procedia	0	0	0	1	0	0	0
European Journal of Physics	0	0	0	1	0	0	0

Annals of Geophysics	0	0	0	1	0	1	1
Bulletin of Earthquake Engineering	0	0	0	1	3	2	1
Journal of Solar Energy Engineering	0	0	0	1	0	0	0
Scientific Data	0	0	0	1	0	2	0
International Geology Review	0	0	0	1	0	0	0
Environmental Earth Sciences	0	0	0	0	1	0	2
Global Journal of Research in Engineering	0	0	0	0	1	0	0
Geoscience Canada	0	0	0	0	1	0	0
Journal of Communication Technology and Electronics	0	0	0	0	1	0	0
Earth and Planetary Physics	0	0	0	0	2	4	1
Earth Surface Dynamics	0	0	0	0	1	1	1
Vidyodaya Journal of Science	0	0	0	0	1	0	0
Geophysics and Geophysical Exploration	0	0	0	0	1	0	0
Journal of Science Education and Technology	0	0	0	0	1	0	0
Navigation	0	0	0	0	1	0	0
Journal of Marine Systems	0	0	0	0	1	0	0
Journal of Physics: Conference Series	0	0	0	0	1	6	0
Weather and Forecasting	0	0	0	0	1	0	0
Earth Science India	0	0	0	0	1	0	0
Journal of Mining Science	0	0	0	0	1	0	0
Resonance	0	0	0	0	1	0	0
Chiang Mai Journal of Science	0	0	0	0	1	0	0
Aims Geosciences	0	0	0	0	1	0	0
Russian Geology and Geophysics	0	0	0	0	1	0	3
Geothermics	0	0	0	0	1	0	0
Mineralogy and Petrology	0	0	0	0	2	0	0
Universal Journal of Geoscience	0	0	0	0	1	0	0
Geophysical Prospecting	0	0	0	0	1	0	1
Journal of Earth Science	0	0	0	0	1	1	0
Advances in Civil Engineering	0	0	0	0	0	1	2
Classical and Quantum Gravity	0	0	0	0	0	1	0
Computational Geosciences	0	0	0	0	0	1	0
Encyclopedia of Solid Earth Geophysics (textbook)	0	0	0	0	0	2	3
Data in Brief	0	0	0	0	0	1	2
Geofizicheskiy Zhurnal-Geophysical Journal	0	0	0	0	0	1	0

Journal of Earth System Science	0	0	0	0	0	2	2
Terra Nova	0	0	0	0	0	1	1
Proceedings of the National Academy of Sciences	0	0	0	0	0	1	3
Terrestrial, Atmospheric and Oceanic Sciences	0	0	0	0	0	1	0
Progress in Disaster Science	0	0	0	0	0	1	0
Geodynamics & Tectonophysics	0	0	0	0	0	1	0
Environmental Modelling & Software	0	0	0	0	0	1	0
Geotechnical and Geological Engineering	0	0	0	0	0	1	0
GPS Solutions	0	0	0	0	0	1	0
GSA Today	0	0	0	0	0	2	0
ISA Transactions	0	0	0	0	0	1	0
Izvestiya, Atmospheric and Oceanic Physics	0	0	0	0	0	1	0
Journal of Mountain Science	0	0	0	0	0	1	0
La Rivista del Nuovo Cimento	0	0	0	0	0	1	0
Sensors	0	0	0	0	0	1	5
Romanian Reports in Physics	0	0	0	0	0	1	0
Landslides	0	0	0	0	0	1	1
Remote Sensing	0	0	0	0	0	2	4
Living Reviews in Relativity	0	0	0	0	0	1	0
The Art and Science of Seismic Interpretation	0	0	0	0	0	1	0
Moscow University Geology Bulletin	0	0	0	0	0	1	0
International Journal of Geophysics	0	0	0	0	0	1	1
Journal of Atmospheric and Oceanic Technology	0	0	0	0	0	1	0
PLoS One	0	0	0	0	0	1	0
Frontiers in Marine Science	0	0	0	0	0	1	0
Earth System Science Data	0	0	0	0	0	1	1
Forensic Explosion Seismology: Technologies and Applications (Book)	0	0	0	0	0	0	1
Acta Carsologica	0	0	0	0	0	0	1
Advanced Engineering Informatics	0	0	0	0	0	0	1
AGU Advances	0	0	0	0	0	0	1
Applied Sciences	0	0	0	0	0	0	1
China Geology	0	0	0	0	0	0	1
Communications Earth & Environment	0	0	0	0	0	0	1
Communications in Computational Physics	0	0	0	0	0	0	1

Computer Supported Cooperative Work (CSCW)	0	0	0	0	0	0	1
Concurrency and Computation: Practice and Experience	0	0	0	0	0	0	1
Current Science	0	0	0	0	0	0	1
Encyclopedia of Complexity and Systems Science	0	0	0	0	0	0	1
Current Science	0	0	0	0	0	0	1
Frontiers in Built Environment	0	0	0	0	0	0	1
Geo-Marine Letters	0	0	0	0	0	0	1
Geoarchaeology	0	0	0	0	0	0	1
Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards	0	0	0	0	0	0	1
Geoarchaeology	0	0	0	0	0	0	1
Geothermal Energy	0	0	0	0	0	0	1
Global Change Biology	0	0	0	0	0	0	1
HNO	0	0	0	0	0	0	1
IAES International Journal of Artificial Intelligence	0	0	0	0	0	0	1
IEEE Transactions on Geoscience and Remote Sensing	0	0	0	0	0	0	1
IEEE Transactions on Signal and Information Processing over Networks	0	0	0	0	0	0	2
IEEE Transactions on Signal Processing	0	0	0	0	0	0	1
IFAC-PapersOnLine	0	0	0	0	0	0	2
International Journal of Engineering Science	0	0	0	0	0	0	1
International Journal of Geographical Information Science	0	0	0	0	0	0	1
Inverse Problems	0	0	0	0	0	0	1
Iranian Journal of Science and Technology, Transactions of Civil Engineering	0	0	0	0	0	0	1
Journal of Earthquake Engineering	0	0	0	0	0	0	1
Journal of Geological Resource and Engineering	0	0	0	0	0	0	1
Journal of Geoscience Education	0	0	0	0	0	0	1
Journal of King Saud University - Science	0	0	0	0	0	0	1
Journal of Marine Science and Engineering	0	0	0	0	0	0	2
Journal of Multidisciplinary Engineering Science and Technology	0	0	0	0	0	0	1
Journal of Space Weather and Space Climate	0	0	0	0	0	0	1
Journal of the Korean Geotechnical Society	0	0	0	0	0	0	1
Journal of Waterway, Port, Coastal, and Ocean Engineering	0	0	0	0	0	0	1
Minerals	0	0	0	0	0	0	1
Natural Science	0	0	0	0	0	0	1

New Zealand Journal of Geology and Geophysics	0	0	0	0	0	0	1
Planetary and Space Science	0	0	0	0	0	0	1
Programming and Computer Software	0	0	0	0	0	0	1
Regional Geology and Tectonics (Second Edition)	0	0	0	0	0	0	2
Revista Geológica de América Central	0	0	0	0	0	0	1
Teaching Climate Change in the United States	0	0	0	0	0	0	1
Telkomnika	0	0	0	0	0	0	1
Temblor	0	0	0	0	0	0	3
The Andaman Islands and Adjoining Offshore: Geology, Tectonics and Palaeoclimate	0	0	0	0	0	0	1
The Cryosphere	0	0	0	0	0	0	1
The VLDB Journal	0	0	0	0	0	0	1
Annals of Glaciology	0	0	0	0	0	0	1
TOTAL	60	82	131	109	80	145	179

Citations Specific to the Global Seismographic Network (GSN)

This year, a more extensive search was conducted to locate references that utilize specific GSN stations or other GSN-related resources that have not been captured during previous searches. These search terms, listed below, provided an additional 89 citations. While these references have *not* been included in the tables and figures above, they have been added to the total number of citations and are included in the list appended to this report.

- SN/II and doi.org/10.7914/SN/II
- SN/IC and doi.org/10.7914/SN/IC
- IDA / International Deployment of Accelerometers
- Global CMT / Global Centroid-Moment-Tensor (combined with IRIS, USGS)
Ekström et al 2012 Globalcmt.org
- Station codes for the top 20 most downloaded station data:

IU.ANMO	II.PFO	II.BRVK / II.BORK	II.KURK
II.AAK	IU.QSPA	IC.MDJ	IU.MAKZ
II.DGAR	II.KDAK	II.WRAB	II.RAYN
II.KAPI	IU.SJG	GT.VNDA (auxiliary seismic station)	
IU.ADK	IU.CTAO	IU.MWBA	II.NIL
- SN/IU and doi.org/10.7914/SN/IU
- SN/CU and doi.org/10.7914/SN/CU

Searching for IRIS Citations in the American Geophysical Union (AGU), the Geological Society of America (GSA), Seismological Society of America (SSA) and the European Geophysical Union (EGU) Abstracts

The NASA ADS Service Abstracts search engine, Google Scholar, and the AGU Meeting search were used to search for AGU proceedings. There were 107 AGU abstracts with citations of IRIS or IRIS facilities (Figure 4) that were mentioned in 2020. This is less than the number of citations from 2018 (n=110) and 2019 (n=149).

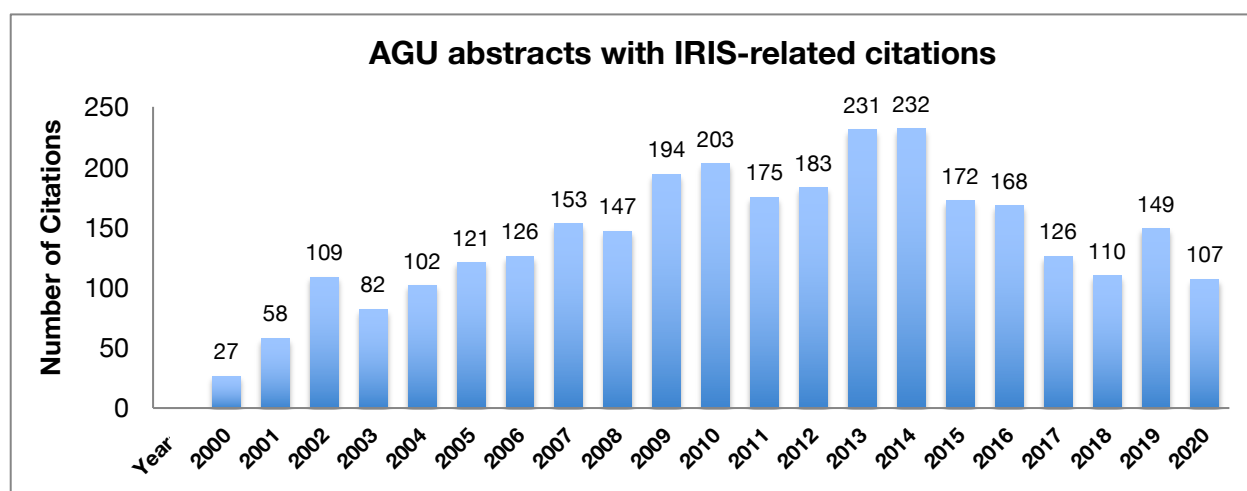


Figure 4. Number of AGU abstracts with IRIS-related citations from 2000-2020.

Because data from the Global Seismographic Network (GSN), the Data Management Center (DMC) and PASSCAL are widely used in studies throughout the world, abstracts of research presented at the Geological Society of America (GSA) Annual Meeting (and associated section meetings), the Seismological Society of America (SSA) Annual Meeting and the European Geosciences Union (EGU) General Assembly were also searched. Google Scholar and the society websites were used to search for GSA, SSA and EGU abstracts that cited IRIS or IRIS facilities. Ten (10) GSA abstracts, 32 SSA abstracts, 10 EGU abstracts and eight additional abstracts from smaller conferences cite one or more relevant search terms. Thus, there were 167 abstracts that used IRIS-related data or information.

Theses

In 2018, IRIS started tracking the number of dissertations that use IRIS resources and facilities. In 2020, there were 44 theses that used IRIS data, resources or facilities. In 2018, there were 62 and in 2019 there were 54 theses containing information from IRIS data or facilities.

Books

In 2018, IRIS started tracking the number of books and book chapters that cite IRIS data, resources or facilities. This year, IRIS was cited in six (6) books. IRIS was cited in 17 books in 2019 and five (5) books in 2018.

Findings from 2020

There were 880 IRIS-related citations in all journals and books in 2020 compared to 687 IRIS-related citations found in all journals and books in 2019. The total number of citations found in abstracts was 167, which is an increase from the previous year. There were 44 theses that cited IRIS and 89 references that cited specific Global Seismographic Network stations or resources. Thus, the total number of IRIS-related references in 2020 is 1180 – 227 more than in 2019.

The increase in citations is the result of significant increases in the number of citations in all journal categories.

The 2020 List of Citations is provided in Appendix A.

Appendix A: 2020 List of Citations

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Note: Citations for some papers presented at AGU, GSA and EGU meetings may include the format "*organization acronym*, edited, pp *session identifier-paper number*".

Appendix A: 2020 List of Citations

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