Journal Guidelines for Geochemical Data Archiving

Resources at COPDESS

COPDESS is the Coalition for Publishing Data in the Earth & Space Sciences that has been bringing together editors, geochemical data repositories, and other stakeholders to discuss and coordinate policies, workflows, and standards for Open and FAIR geo/cosmochemical data.

The COPDESS webpages offer a number of general resources for journals and authors, most of which are directly applicable to geochemical data.

https://copdess.org/enabling-fair-data-project/author-guidelines/
https://copdess.org/copdess-suggested-author-instructions-and-best-practices-for-journals/
https://copdess.org/data-policies/
https://copdess.org/enabling-fair-data-project/commitment-statement-in-the-earth-space-and-environmental-sciences/

Domain Repositories for Geo/Cosmochemical Data

A list of domain data repositories for geo/cosmochemistry is provided below, which is a selection compiled from re3data, and inspired by the AGU and Nature recommendations.

There are relatively few repositories for general geo/cosmochemistry, and many more that do not fulfill the requirements of trusted data repositories or that will only accept datasets with a specific scope or those that are produced within specific countries/regions, projects or supported by specific funding agencies.

Note: This is likely not a comprehensive list and other repositories may also be suitable (re3data has a noticeable regional bias: https://www.re3data.org/browse/by-country/). We have specifically avoided any institutional repositories since they do not offer any geochemical data curation.

Search for repositories:
https://commons.datacite.org/repositories
https://www.re3data.org/

Criteria for inclusion:

- Compliance with basic FAIR and TRUST principles, ideally also the and CARE principles
- Offer DOI minting; long-term preservation policy
- Private review link; DOI reserved / data embargo
- Basic geochemical data curation and review

General Geochemistry

EarthChem Library https://earthchem.org/ecl/
Scope: An open-access repository for geochemical datasets (analytical data, experimental data, synthesis databases) and other digital resources relevant to the field of geochemistry. The EarthChem Library offers data preservation and access, including long-term archiving and registration of data with Digital Object Identifiers (DOIs).
Policies: https://earthchem.org/ecl/policies/

General Cosmochemistry

Astromaterials Data Archive https://repo.astromat.org/
Scope: The Astromaterials Data System is NASA's designated archive for laboratory analytical data acquired on samples returned from space by NASA missions as well as meteorites in NASA's collections. Astromat provides trusted repository services for researchers to publish and archive astromaterials sample data in compliance with Open and FAIR Data policies of funding agencies and publishers. Astromat welcomes contributions of a broad range of data for extraterrestrial materials, including but not limited to, compositional data for samples of lunar rocks, meteorites, and other astromaterials and the minerals, melt and fluid inclusions, chondrules, and presolar grains that they contain. Astromat also accepts geochemical synthesis datasets; geochronological data; petrographic descriptions of samples; kinetic data from geochemical and petrological experiments. AstroMat is developed and operated at the Lamont-Doherty Earth Observatory of Columbia University and funded by NASA.
Policies: https://www.astromat.org/submit-data/submission-guidelines/, https://earthchem.org/ecl/policies/

General Earth & Environmental Sciences

GFZ Data Services https://dataservices.gfz-potsdam.de/
Scope: Since 2004, the GFZ German Research Centre for Geosciences assigns Digital Object Identifiers (DOI) to datasets. These datasets are archived by and published through GFZ Data Services and cover all geoscientific disciplines. They range from large dynamic datasets deriving from data intensive global monitoring networks with real-time data acquisition to the full suite of highly variable datasets collected by individual researchers or small teams. These highly variable data ('long-tail data') are small in size, but represent an important part of the total scientific output.
Policies: https://dataservices.gfz-potsdam.de/portal/about.html

PANGAEA https://www.pangaea.de/

Scope: open-access library for archiving, publishing, and disseminating georeferenced data from the Earth, environmental, and biodiversity sciences. Originally evolving from a database for sediment cores, it is operated as a joint facility of the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) and the Center for Marine Environmental Sciences (MARUM) at the University of Bremen. PANGAEA holds a mandate from the World Meteorological Organization (WMO) and is accredited as a World Radiation Monitoring Center (WRMC). It was further accredited as a World Data Center by the International Council for Science (ICS) in 2001 and has been certified with the Core Trust Seal since 2019. The successful cooperation between PANGAEA and the publishing industry along with the correspondent technical implementation enables the cross-referencing of scientific publications and datasets archived as supplements to these publications.
Policies: https://pangaea.de/about/terms.php

NOAA (National Oceanic and Atmospheric Administration, USA) https://www.ncei.noaa.gov/
Scope: NOAA's National Centers for Environmental Information (NCEI) are responsible for hosting and providing public access to one of the most significant archives for environmental data on Earth with over 20 petabytes of comprehensive atmospheric, coastal, oceanic, and geophysical data. NCEI provides archive services for much of the data collected by NOAA scientists, observing systems, and research initiatives. We manage a comprehensive collection of environmental information from a broad range of time periods, observing systems, scientific disciplines, and geographic locations. Our world class stewardship services preserve data for future use on behalf of our science-user communities and the general public.
Policies: https://www.ncei.noaa.gov/archive

Specific Sub-Disciplines relevant to Geo-/Cosmochemistry

DIGIS Geochemical Data Repository for GEOROC https://data.goettingen-research-online.de/dataverse/digis
Scope: The GEOROC data repository hosts research data within the scope of the GEOROC database: geochemical compositions of rocks, glasses, minerals and inclusions from all geological settings on Earth. The repository is curated by the Digital Geochemical Data Infrastructure (DIGIS) project at Göttingen University.
Policies: https://uni-goettingen.de/en/georoc+data+repository/651621.html
Notes: to be hosted by GFZ Data Services going forward

National/Project/Funder-Specific Repositories (Do not necessarily fulfill the above listed requirements)

AIMS Data Repository https://www.aims.gov.au/data

Scope: The Australian Institute of Marine Science (AIMS) is a tropical marine research centre. The AIMS Data Repository preserves experimental and survey data, sensor data, research analyses and other types of data collected by projects conducted by the Australian Institute of Marine Science (AIMS). Contributors to the repository are primarily AIMS researchers from various science disciplines including ecology, biology, environmental sciences, microbiology, geosciences and oceanography, geochemistry, biodiversity conservation, evolutionary environmental studies, climate and oceanic change, fisheries, biochemistry and molecular biology, limnology and functions of inland waters, genetics and hereditary, observing network.
Policies: https://www.aims.gov.au/data/data-policy

AusGeochem https://www.auscope.org.au/ausgeochem
Scope: AusGeochem provides a centralised repository allowing Australian laboratories to upload, archive, disseminate and publish their datasets. The intuitive user interface (UI) allows users to access national publicly funded data quickly through the ability to view an area of interest, synthesise a variety of geochemical data in real-time, and extract the required data, gaining novel scientific insights through multi-method data collation.
Policies: https://www.auscope.org.au/ausgeochem-tcs

Biological and Chemical Oceanography Data Management Office (BCO-DMO)
https://www.bco-dmo.org/
Scope: The Biological and Chemical Oceanography Data Management Office (BCO-DMO) is a publicly accessible earth science data repository created to curate, publicly serve (publish), and archive digital data and information from biological, chemical and biogeochemical research conducted in coastal, marine, great lakes and laboratory environments. The BCO-DMO repository works closely with investigators funded through the NSF OCE Division's Biological and Chemical Sections and the Division of Polar Programs Antarctic Organisms & Ecosystems. The office provides services that span the full data life cycle, from data management planning support and DOI creation, to archive with appropriate national facilities.
Policies: https://www.bco-dmo.org/terms-use

British Oceanographic Data Centre (BODC) https://www.bodc.ac.uk/
Scope: The British Oceanographic Data Centre (BODC) is a national facility for looking after and distributing data concerning the marine environment. We deal with biological, chemical, physical and geophysical data, and our databases contain measurements of nearly 22,000 different variables.
Policies: https://www.bodc.ac.uk/submit_data/data_planning/deposit_conditions/

BGS National Geoscience Data Centre (NGDC) https://www.bgs.ac.uk/ngdc/
Scope: The BGS is a data-rich organisation with over 400 datasets in its care; including environmental monitoring data, digital databases, physical collections (borehole core, rocks, minerals and fossils), records and archives. Our data is managed by the National Geoscience Data Centre.
Policies: https://www.bgs.ac.uk/geological-data/national-geoscience-data-centre/

UK Polar Data Centre https://www.bas.ac.uk/data/uk-pdc/
Scope: The UK Polar Data Centre (UK PDC) is the focal point for Arctic and Antarctic environmental data management in the UK. Part of the Natural Environmental Research Council's (NERC) network of environmental data centres and based at the British Antarctic Survey, it coordinates the management of polar data from UK-funded research and supports researchers in complying with national and international data legislation and policy.
Policies: https://www.bas.ac.uk/data/uk-pdc/data-policy/

ESS-DIVE https://ess-dive.lbl.gov/
Scope: The U.S. Department of Energy's (DOE) Environmental Systems Science Data Infrastructure for a Virtual Ecosystem (ESS-DIVE) data archive serves Earth and environmental science data. ESS-DIVE is funded by the Data Management program within the Climate and Environmental Science Division under the DOE's Office of Biological and Environmental Research program (BER), and is maintained by the Lawrence Berkeley National Laboratory. ESS-DIVE will archive and publicly share data obtained from observational, experimental, and modeling research that is funded by the DOE's Office of Science under its Subsurface Biogeochemical Research (SBR) and Terrestrial Ecosystem Science (TES) programs within the Environmental Systems Science (ESS) activity. ESS-DIVE was launched in July 2017, and is designed to provide long-term stewardship and use of data from observational, experimental and modeling activities in the DOE in the Subsurface Biogeochemical Research (SBR) and Terrestrial Ecosystem Science (TES) Programs in the Environmental System Science (ESS) activity.
Policies: https://www.energy.gov/datamanagement/doe-policy-digital-research-data-management

Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC)
https://daac.ornl.gov/
Scope: The Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) for biogeochemical dynamics is one of the National Aeronautics and Space Administration (NASA) Earth Observing System Data and Information System (EOSDIS) data centers managed by the Earth Science Data and Information System (ESDIS) Project. The ORNL DAAC archives data produced by NASA's Terrestrial Ecology Program. The DAAC provides data and information relevant to biogeochemical dynamics, ecological data, and environmental processes, critical for understanding the dynamics relating to the biological, geological, and chemical components of Earth's environment.
Policies: https://daac.ornl.gov/about/#citation_policy

Tethys https://www.tethys.at/
Scope: Tethys is an Open Access Research Data Repository of the GeoSphere Austria, which publishes and distributes georeferenced geoscientific research data generated at and in cooperation with the GeoSphere Austria. The research data publications and the associated metadata are predominantly provided in German or in English. The abstracts are provided in both languages. Tethys aims to provide published data sets as open data and in accordance with the FAIR Data Principles, findable, accessible, interoperable and reusable.

Policies: https://www.tethys.at/docs/PreservationPlanTethys.pdf

TRR170-DB https://planetary-data-portal.org/
Scope: The TRR170-DB was set up to manage data products of the collaborative research center TRR 170 'Late Accretion onto Terrestrial Planets' (https://www.trr170-lateaccretion.de/). However, meanwhile the repository also stores data by other institutions and researchers. Data include laboratory and other instrumental data on planetary samples, remote sensing data, geological maps and model simulations.
Policies: https://info.planetary-data-portal.org/Data-Policies/index.html