WHY OPEN SCIENCE?

Reproducibility Issues in Science Experiments

Open science allows for transparency in the research process by sharing data and methods. This way other researchers can verify results and identify potential errors or issues.

More Equitable and Diverse Data

Open science allows research to be more accessible to a wider audience. Scientists can build on existing work by sharing data and methods, contributing to the scientific community. This leads to a more diverse range of perspectives on the science being studied.

Empower Communities

Open science allows for more people to become informed about scientific findings, engaging others in the research process. This leads to a more inclusive community where diverse perspectives are valued so everyone has the opportunity to contribute to science.

Increased Peer Collaboration Across Disciplines

Open science allows for an increase in comprehensive understanding where collaborative research can help solve complex issues that require various perspectives.

More Accurate and Reputable Science

Open science allows for more transparent science, which leads to more thorough research. The more open science is, the less fraudulent or unethical practices occur. Open science can prevent damaging the reputation of the scientific community.

NASA

The Year of Open Science!

NASA has declared 2023 the year of Open Science! This places an emphasis on accessible data, increased collaboration among disciplines, and transparent research processes.

If you're wondering how you can get involved, heres a few ideas:

How to share your research

Open Access Journals

- These are research journals that publish information to be available to readers at no cost
  - F100 Research
  - NASA's Earthdata Cloud
  - NASA's Earth Observing System Data and Information System (EOSDIS) Archival

Academic Collaboration Platforms

- Online networking offers an easy way for researchers to collaborate and connect
  - Research Gate
  - Academia.edu
  - DeepESDL

- **Attend Open Science Trainings**
  - Trainings enhance the abilities of researchers to practice open science principles and procedures
    - Facilitate Open Science Training for European Research (FOSTER)
- **Keeping an Open Journal**
  - This is the practice of making the primary record of a research project publicly available online as it is recorded

How to obtain open research

- **Open Access Journals**
  - Yes! Open Access Journals are listed again because they are such a valuable sources for sharing *and* receiving information
    - Public Library of Science
    - NASA's PubSpace
- **Open Data**
  - Organizations and independent research groups will publish data for both researchers and the public to freely reference
    - NASA's Open Data Portal
    - NASA's ICE Cryosphere Research

Key

- Earth Science Specific Resources
- Cryosphere Specific Resources
- General Open Science Resource
- NASA Specific Resource

The Year of Open Science!

Open Sciece projects in Earth Science

- **NASA's Transform to Open Science (TOPS)**
  - NASA has created a five-year initiative to recenter research culture around the tenets of open science
- **NASA's The Pangeo Project**
  - Allows both the community and researchers to analyze Earth Science data in the cloud
- **The Collaborative Replications and Education Project (CREP)**
  - CREP provides training, support, and professional growth opportunities for students and instructors completing replication projects
- **NASA's Multi-mission Algorithm Analysis Platform (MAAP)**
  - MAAP brings together relevant data, algorithms, and computing capabilities in a common cloud for public use.

Open Science Advocacy Groups

- **NASA'S Advancing Collaborative Connections for Earth System Science (ACCESS) Program**
  - The ACCESS program develops technologies and strategies to make NASA's archives more accessible for all
- **Citizen Science for Earth Systems Program (CSESP)**
  - The CSESP program focuses on utilizing public contributions as a source for furthering the understanding of Earth as a system
- **NASA's Making Earth System Data Records for Use in Research Environments (MEaSURES)**
  - MEaSURES provides an opportunity for the research community to participate with NASA and review data in the field of earth science
- **The European Geosciences Union**
  - This European Geosciences Union focuses on collaboration between researchers, earth science organizations, and the community in finding solutions to problems in the field of earth science.

Key

- Earth Science Specific Resources
- Cryosphere Specific Resources
- General Open Science Resource
- NASA Specific Resource

Looking for a Few More Resources?

Open Access Journals

- F1000 Research
- Open Science Framework
- Public Library of Science (PLOS)
- bioRxiv
- Pub Space
- EOSDIS Distributed Active Archive Centers (DAAC)
- The Cryosphere (TC)
- oa.mg
- oa.mg Open Access Cryosphere Journals

Academic Collaboration Platforms

- Research Gate
- Academia.edu
- DeepESDL

Open Science Trainings

- Facilitate Open Science Training for European Research (FOSTER)
- Center for Open Science Openness and Reproducibility Research Practices Training

Open Data Archives

- NASA's Earth Science Data Systems (ESDS)
- EarthData Data Tools
- NASA Worldview
- NASA Giovanni
- NASA's Geographic Information System (GIS)
- NASA Open Data Portal
- Global Imagery Browse Services (GIBS)
- Common Metadata Repository (CMR)
- EarthData Code Collaborative (ECC)
- NASA API's
- National Snow and Ice Data Center (NSIDC)
- EarthData Cryosphere Subtopic
- Earth System Data Lab

Open Science Initiatives

- Esri.com
- NASA's Earth System Observatory
- Multi-mission Algorithm and Analysis Platform (MAAP)
- NASA's The Pangeo Project
- The Collaborative Replications and Education Project (CREP)
- NASA's Transform to Open Science (TOPS)
- The Panton Principles

Open Science Advocacy Groups

- Budapest Open Access Initiative
- The Amsterdam Call for Action on Open Science
- NASA's Advancing Collaborative Connections for Earth System Science (ACCESS) Program
- Citizen Science for Earth Systems Program (CSESP)
- Making Earth System Data Records for Use in Research Environments (MEaSURES)
- NASA Health and Air Quality
- The European Geosciences Union

Key

- Earth Science Specific Resources
- Cryosphere Specific Resources
- General Open Science Resource
- NASA Specific Resource