

Prepare your team for Open Science – *RESEARCH/PROJECT TEAM OPEN SCIENCE PRACTICES*

Welcome to “Your Open Science Journey”!

Develop and use Open Science practices for your lab or research team. Use this guidance to improve your team’s data and software management practices supporting Open Science. Codify them in your team’s Code of Open Science Practice.

Target Audience

Primary: Team or project lead
Secondary: Team or project researcher

This checklist is generalized and will need to be adjusted based on your institution, lab, research team, and/or funder requirements.

The Code of Open Science Practice should include defined expectations on:

- A. [Team Composition](#)
- B. [Working Collaboratively, Transparently and Openly](#)
- C. [Team Tasks and Responsibilities](#)
- D. [Team Communication](#)
- E. [Digital Object Sharing](#)

A. BUILD TEAM AND ALIGN TRUST, EXPECTATIONS, AND CONDUCT

1. **Co-build the team composition.** Diversity in team composition supports higher impact scientific discoveries:
 - a. **Choose team members with skills** to support the research objectives.
 - b. Ensure **balance of gender, race/ethnicity, experience, geography, scientific discipline, and career stage** within your team to widen your perspective.
 - c. Include members with strengths in **bridge-builders, record-keepers, and leaders**.
2. **Develop a team Code of Open Science Practice (checklist below).** Use this guidance to develop common practices for the team to follow.
 - a. **Ensure team members endorse and comply with the team Code of Open Science Practice.** All team members should know the location of the team’s Code of Open Science Practice, expectations of adherence, and the consequences of non-adherence. These practices and shared goals can be embedded in the team’s Code of Conduct or working principles. For an example, see [AGU’s Scientific Integrity and Professional Ethics](#).
 - b. **Ensure team members adhere to the appropriate community, national, and international standards** for conducting research and reporting the results of their scientific activities including respecting the intellectual property rights of others. See below for [information about sensitive data](#).

3. **Organize adequate time for the team to converge and align on the common research goal(s), progress milestones, and estimated timelines.** Periodically revisit these together as research proceeds. Note that team members may find value in participating in research for different reasons. Producing knowledge is commonly a primary motivation, but team members may also highly value developing networks and skills or achieving professional goals. By understanding the motivation of each team member and aligning individual goals with team goals, success is more likely.

B. WORK AS COLLABORATIVELY, TRANSPARENTLY, AND OPENLY AS POSSIBLE.

1. **Work collaboratively:** Create opportunities for team members to build relationships, facilitate discussions, build bridges among members from different disciplines. This is the pathway to innovation.
2. **Work transparently:** Share status updates, information, and digital objects through the common project resources (see [Open Science Resources and Guidance for Teams](#)). Actively keep and share, team meeting notes, progress reports, presentations, recordings, shared folders, data/software (with appropriate and sufficient metadata for documentation). Notably, this includes project outputs distributed beyond the team. Digital objects include datasets, software, papers, posters, presentations etc.
3. **Work openly:** Provide a way for all team members to participate and be included in the various aspects of the project work.
 - a. Working transparently helps build openness by enabling the shared understanding needed to use and contribute to the work of other team members. This is also an excellent way to help early career researchers and members from all disciplines contribute to the objectives of the project.
 - b. All research objects should be rendered digitally to ensure equitable access. For those objects that are physical, such as samples, the information about those objects should be made digital.
 - c. Specify the criteria used for selecting which research objects are shared. For instance, for protected datasets, restrictions may be necessary to comply with data access agreements.
 - d. Teams should have access to all relevant research objects as well as training and support to understand and use the research objects.
 - e. Team members should be expected to both contribute and receive recognition for their contributions.

C. ESTABLISH TEAM TASKS AND RESPONSIBILITIES

Team tasks emerge from shared common goals and the pathways to achieving these goals. Each project will require a specific set of tasks and skills to realize its goals. Team members should work together to align individual skills and expertise with tasks and responsibilities.

1. **Ensure each task has an assigned team member. For example,**
 - a. Development of a Data and Digital Output Management Plan (e.g., Data Management Plan, DMP or DDOMP)
 - b. Communication of tasks and responsibilities
 - c. Management of digital object versions and outputs. E.g., data, software
 - d. Quality checking of digital objects and outputs.

- e. Management of archives and preservation for the project (including past the project end date)
2. Review tasks and assignments periodically.
 - a. Check for updates and improvements that need to be made.
 - b. Reassign responsibilities according to changes in team members (e.g., member added, member leaves, improvement in skill level).
 - c. Plan to mitigate possible points of failure (e.g., by ensuring there is a backup person for important tasks).
 - d. Invite all interested members to review processes and outputs.

D. ESTABLISH TEAM COMMUNICATION

Teams benefit from communication practices that facilitate continuity of work and common understanding.

1. Establish a regular point of contact for tasks and responsibilities and set times for meetings and discussions. For example, recurring meetings should be scheduled for team leadership to check in on work progress.
2. If the group is multilingual, conduct meetings using both discussion and text to ease translation efforts (e.g., meeting recordings, chat, detailed definitions, rewording of complex terms, automated transcription)
3. Allow sufficient time for common understanding of the work and the role of each team member to develop. Communication practices should be updated as new members join and others leave.
4. Ensure the team has ample time to develop personal relationships, preferably in-person, to establish team cohesion, trust, and long-term collaboration. For example, projects that last more than one year might consider conducting a yearly in-person workshop. For international teams, these workshops should ideally rotate locations among countries while considering the environmental cost.
5. Express gratitude for what each member can contribute. Not all members will provide a similar level of effort at the same time for many reasons. It is important to encourage each team member's effort.

E. DETERMINE WHAT AND WHEN DIGITAL OBJECTS CAN BE SHARED OPENLY?

1. **Have flexibility.** Team members will have different comfort levels with sharing their work openly within the team. Determine what level of sharing is required versus what is encouraged through the progress of the project. Demonstrate a flexible environment for feedback and improvements. Digital objects improve in quality and impact when reviewed by other team members (and when reviewing is publicly recognized). For more information on the steps to preserve digital objects, see [Digital Objects Preservation Checklist for Teams](#).
2. **Track and manage information on data and/or software licensing, Data Transfer Agreements, or Restricted Use Agreements** When reusing data, software, and other digital objects make sure you are compliant with the object license and the Data Transfer Agreements (when relevant).
 - For data, the most open licenses are [CC0](#) and [CC BY 4.0](#) ([read more here](#)).
 - For software, look for MIT or [GNU GPLv3](#) ([read more here](#)).

- More information on tracking and managing digital objects in [Digital Objects Preservation Checklist for Teams](#).
3. **Comply with laws protecting sensitive data.** Consult your Institutional Review Board (IRB) or your local ethics committee, and/or your Institution Data Protection Officer when creating or using protected or sensitive types of data. For example, the following will likely need special attention (along with authoritative resources outlining ethical practices):
- Survey data, geo-coded data, [UK Statistics Authority Ethical Considerations](#)
 - Personal identification information, EU GDPR (contact your institution Data Protection Officer), [US PII](#)
 - Health information, [US HIPAA](#)
 - Protected Species, [IUCN Red List](#)
 - Indigenous data sovereignty [CARE Principles for Indigenous Data Governance](#), [Global Indigenous Data Alliance](#), [OCAP® \(Ownership Control Access and Possession\) English, French](#).
 - Artificial intelligence/machine learning [Assessment List Trustworthy AI](#) from the European AI Alliance

Quick Links to related checklists:

- [Your Digital Presence](#)
- [Data Documentation and Citation Checklist](#)
- [Software Documentation and Citation Checklist](#)
- [Open Science Resources and Guidance for Teams](#)
- [Digital Objects Preservation Checklist for Teams](#)

To recommend updates, please email datahelp@agu.org. Include the name and DOI for the checklist in your email.

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