Open Science, Community Building, and Co-Creation with the Bay Area Open Science Group

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July 26, 2023

BAOSG Co-Organizers

This is a community affair!

Ariel Deardorff

UC San Francisco

Sam Teplitzky

UC Berkeley

Sam Wilairat

Stanford

John Borghi

Stanford

(past organizer)

Our Contexts

UC Berkeley (Sam T.)

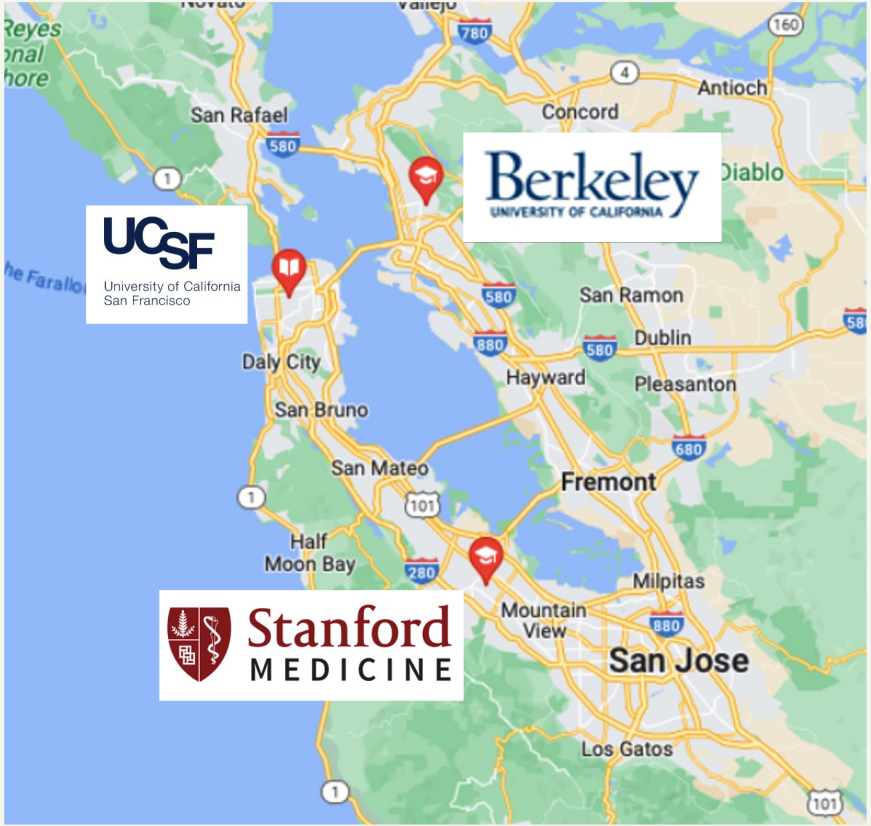
- 32,479 undergraduates
- 12,828 graduate students
- Top majors: Computer Science, Economics, Data Science, Molecular & Cell Biology

UC San Francisco (Ariel)

- Health sciences graduate research university
- #1 public recipient of NIH funds

Stanford Medicine (Sam W.)

- Comprised of School of Medicine, Stanford Health Care, and Stanford Children's Health
- Highest NIH funding per researcher ratio in the country



Outline

1. Defining Open Science
2. The changing roles of STEM librarians
3. Open Science Communities
4. The Bay Area Open Science Group
5. Open Science Team Agreements Template
6. Discussion + Activity

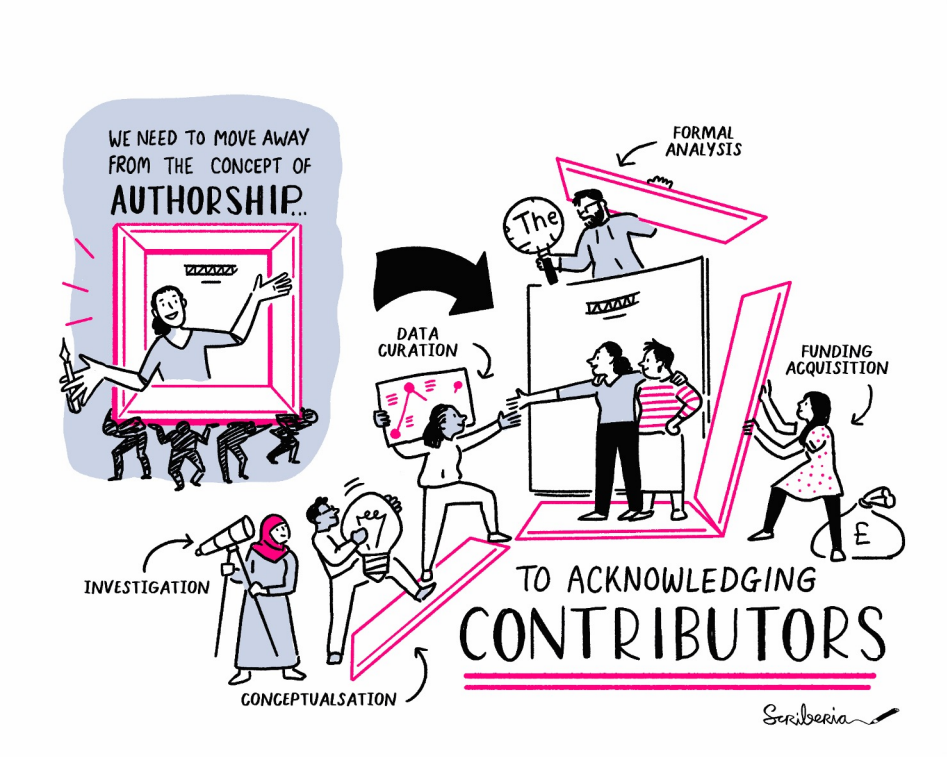
What is open science?

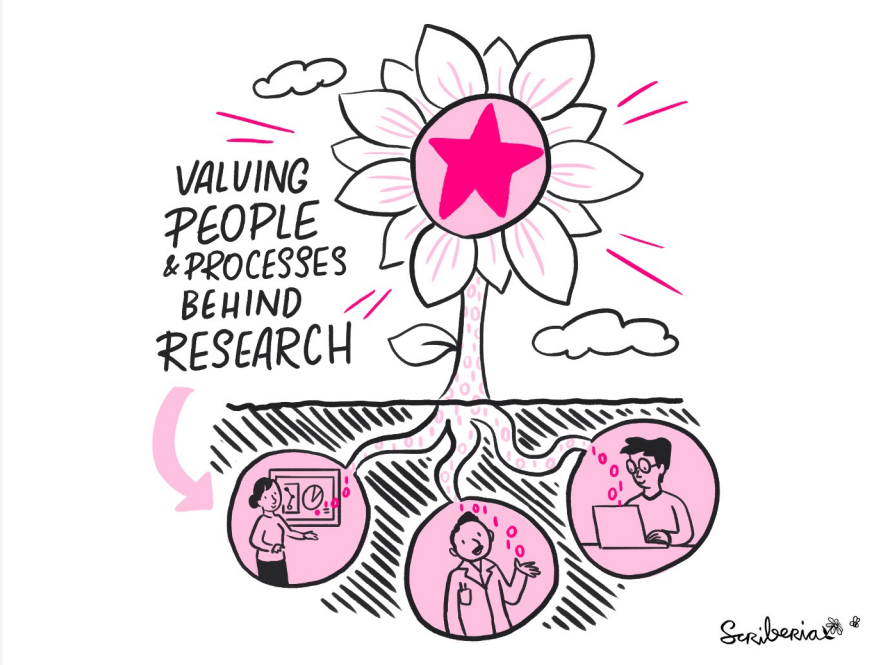
Open science combines various movements and practices aiming

- to make multilingual scientific knowledge openly **available, accessible and reusable** for everyone,
- to increase scientific **collaborations** and sharing of information for the benefits of science and society,
- and to open the **processes** of scientific knowledge **creation, evaluation and communication** to societal actors beyond the traditional scientific community.

UNESCO Recommendation on Open Science
https://unesdoc.unesco.org/ark:/48223/pf0000379949

Not just focused on outputs





The Turing Way Community, & Scriberia. (2023). Illustrations from The Turing Way: Shared under CC-BY 4.0 for reuse. Zenodo. https://doi.org/10.5281/zenodo.7587336

Open Science Practices

- **Open Access** - accessible + readable publications with no restrictions
- **Open Data** - research data, often raw data, shared + licensed for reuse
- **Open Methods + Protocols** - step-by-step documents describing how research was performed
- **Open Code** - allows for computational reproducibility
- **Open Source** - software + source code licensed for sharing + distribution
- **Open Educational Resources** - teaching and learning materials in the public domain
- **Open Pedagogy** - students as co-creators
- **Open Authorship** - transparent roles + contributions in a scientific collaboration

Changing Role of STEM Librarians

STEM Librarians - Past

Traditional Approach

Roles: Reference,

Instruction, Collections

Collaboration:

Subject/Department

Data: Usage, Evaluation

Open: Open Access (OA)

STEM Librarians - Present

Traditional Approach

Roles: Reference, Instruction, Collections

Collaboration: Subject/Department

Data: Usage, Evaluation

Open: Open Access (OA)

Current Environment

Roles: + Data, Scholarly Communications, Assessment

Collaboration: Inter-department

Data: Researcher support/ Technical competencies

Open: OA + data, open educational resources (OER)

STEM Librarians + Institutions

Traditional Approach

Institutional Priorities

Current Environment

Collaboration: campus partners - IT, research support
Data: support for research data to meet funder mandates
Open: championing "open" - science, knowledge, research
Scale: scaling/sustaining these efforts

Observations on Research Libraries' Alignment with Institutional STEM Priorities. May 2023. https://doi.org/10.29242/report.stem2023.

Sam T's journey to open science

Earth Science Librarian

+ Physics + Astronomy,
  ~ Chemistry
+ Little bit of open access
  (working groups/committees)

Alignment with strategic plan
Central "open" access support
Big campus - new programs like data science

Open Science Librarian

+ Earth Science
+ Researcher workflow support
+ Open science community
+ Journal editor - Seismica
+ Jupyter/python competency
+ < Collections

Discussion: Open Science in your role

What does Open Science look like in your role?

Share in Poll Everywhere! **PollEv.com/stem**

What does open science look like in your role?

Nobody has responded yet.

Hang tight! Responses are coming in.

Open Science Communities

Communities come in different forms

ReproducibiliTea

Global network of journal clubs focused on open science + reproducibility

OSCs

Bottom up open science communities (ex. NL), connecting policy + practice through local relationships

NASA TOPS

Transform to Open Science, rapid engagement, transformation, outreach to agencies + organizations

Carpentries

Inclusive community teaching data and coding skills

Turing Way

Resource + collaboration dedicated to reusable and transparent research

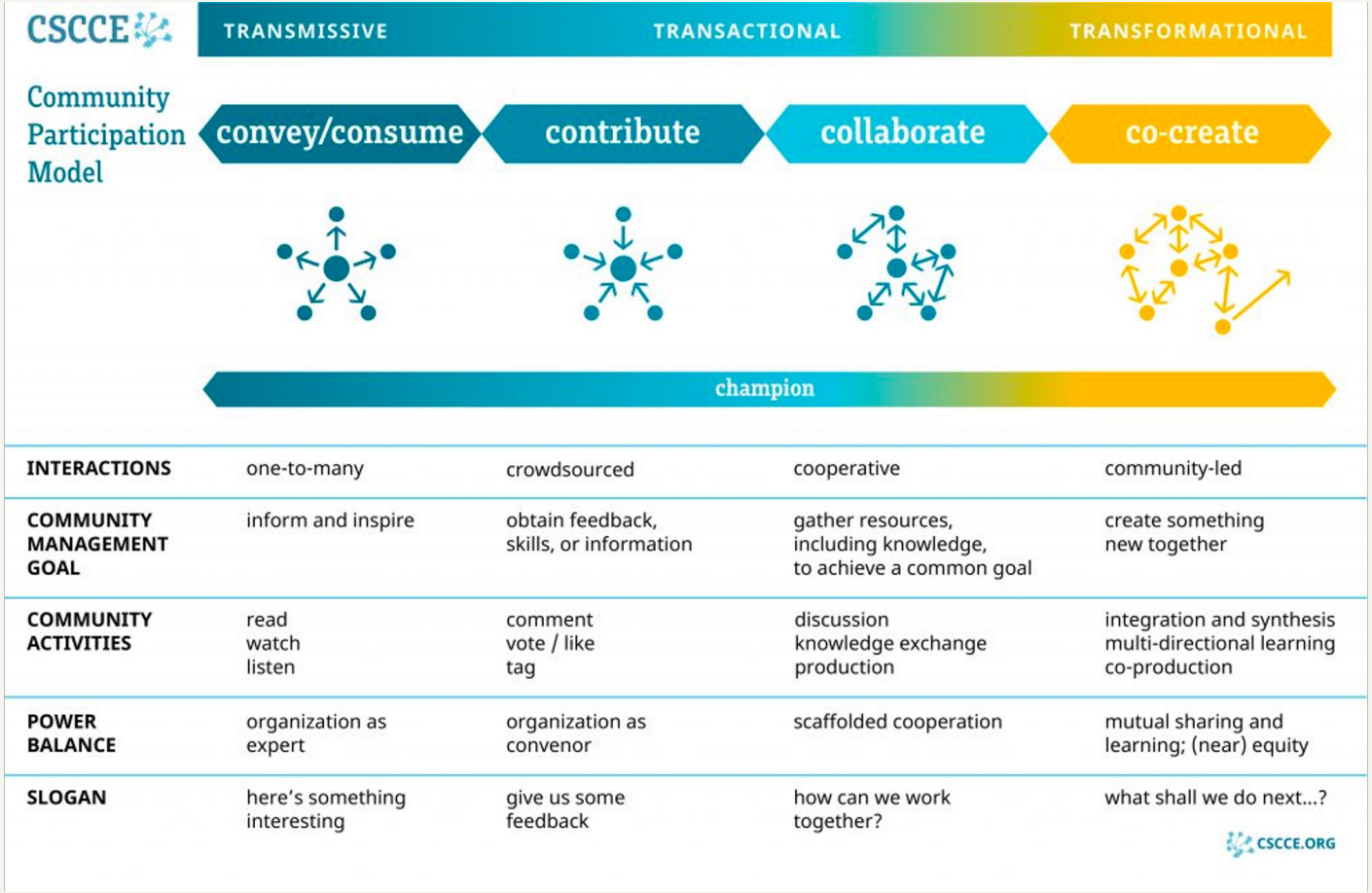
The Neuro

Leader and "living lab" for open science practices at McGill; develops tools + infrastructure, measures impact

Early campus-specific efforts

- Ariel was involved with an open science staff group at UCSF starting in 2018
    - Very library-dominated, needed a more sustainable structure
- John started an open science reading group at Stanford in 2020
    - Lots of work to schedule and host every month!
- Sam T. was building a ReproducibiliTea group at Berkeley in 2021
    - Lack of ongoing engagement + collaborator departure

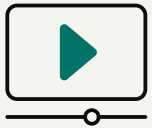
We saw an opportunity to combine forces! Created the Bay Area Open Science Group



Center for Scientific Collaboration and Community Engagement. (2020) The CSCCE Community Participation Model – A framework for member engagement and information flow in STEM communities. Woodley and Pratt doi:10.5281/zenodo.3997802CSCCE

The Bay Area Open Science Group

About the Bay Area Open Science Group



Virtual community for students, faculty, and staff at UC San Francisco, UC Berkeley, Stanford, and non-affiliated friends!

Goal is to increase **awareness of** and **engagement with** all things **open science,** including open access articles, open research data, open source software, and open educational resources.

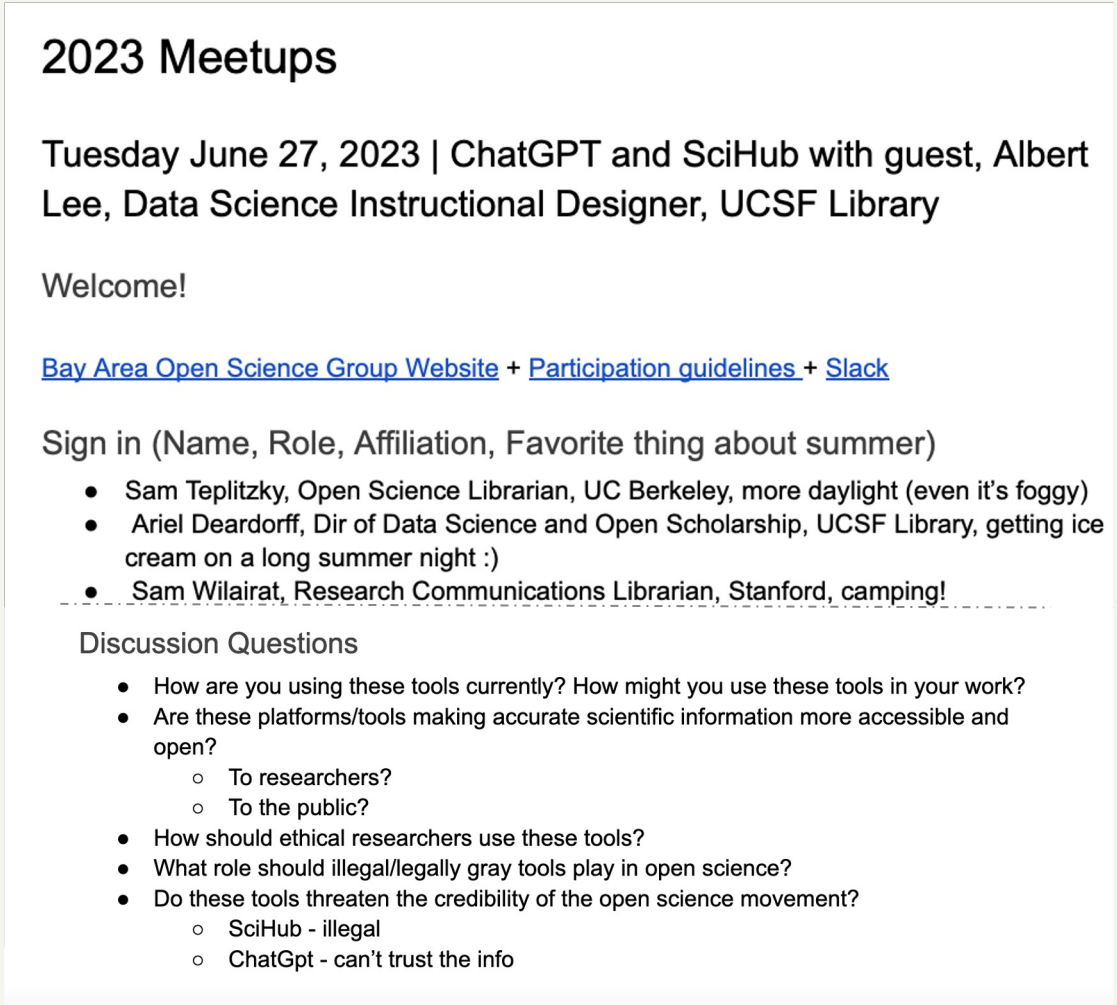
We host **monthly virtual meetups** with a featured speaker from one of the three campuses who shares a project related to open science. We also have a community Slack workspace.

A Sample of Recent Speakers

Title	Speaker
#FOAMed (Free Open Access Medical education)	Dana Larsen, UCSF
NASA TOPS (Transform to Open Science) Curriculum Development	Natasha Batalha, NASA Ames
Project TARA (Tools to Advance Research Assessment), Building Blocks for Impact	Ruth Schmidt, Institute of Design, Illinois Tech
Open and Reproducible Science at Stanford	Joshua Buckholtz, Stanford
Open Science in Bioengineering with the Fraser Lab	Robbie Diaz + Christian MacDonald, UCSF
Open Data	Steve Diggs, California Digital Library
ChatGPT and SciHub	BOASG facilitators and Albert Lee, UCSF

Emphasis on Open Collaboration

Collaborative Notes from June 2023 meetup



2023 Meetups

Tuesday June 27, 2023 | ChatGPT and SciHub with guest, Albert Lee, Data Science Instructional Designer, UCSF Library

Welcome!

Bay Area Open Science Group Website + Participation guidelines + Slack

Sign in (Name, Role, Affiliation, Favorite thing about summer)

- Sam Teplitzky, Open Science Librarian, UC Berkeley, more daylight (even it's foggy)
- Ariel Deardorff, Dir of Data Science and Open Scholarship, UCSF Library, getting ice cream on a long summer night :)
- Sam Wilairat, Research Communications Librarian, Stanford, camping!

Discussion Questions

- How are you using these tools currently? How might you use these tools in your work?
- Are these platforms/tools making accurate scientific information more accessible and open?
  - To researchers?
  - To the public?
- How should ethical researchers use these tools?
- What role should illegal/legally gray tools play in open science?
- Do these tools threaten the credibility of the open science movement?
  - SciHub - illegal
  - ChatGpt - can't trust the info

Our Audience

Early to Established Career Status

Students, Faculty, Administrators, and more come to meetups

Familiarity with Open Science Varies

Our participation guidelines welcome all regardless of how "open" their practices are

Topics at all levels

Sessions vary including works in progress, tutorials, policy-focused, new + emerging topics

Getting it Done

Sam T., Ariel, and Sam W. meet once a month to plan and coordinate upcoming sessions. Between meetings we stay in touch via Slack

Each session has a main facilitator who is in charge of recruiting the speaker, writing the session description, preparing collaborative documents and hosting the meeting

We are each in charge of promotion for our own campus, reaching out to different email lists, community groups, and departments depending on the topic of the month

Open Science Team Agreements Template

Our Challenge: Open science is a buffet of practices

Idea: Create a modifiable team template for open science

- Inspired by lab group manuals
- Describes several open science practices, with a short blurb and link to learn more
- Labs or teams can use it to start conversations, learn about open science, and commit to new practices
- Designed to be edited and revised as practices change

The Template covers

Focus on both **products** and **process** of science

1

Authorship and Collaboration

2

Articles and Research Materials

3

Data and Code

4

Communication and Impact

Open Science Team Agreement

PI/Lab/Team Name
Date

*The **Open Science Team Agreement** gives researchers and other stakeholders the tools they need to understand and advocate for open science practices at a broader scale-within their laboratory, department, or the broader community.*

How to use this template

This template is designed to be an open science conversation starter. To use it for your team, make a copy of the google doc by going to File > Make a Copy. Learn more about the topics below, modify the highlighted sections, and delete the sections that aren't relevant to your research (including this one!).

Introduction

Open Science is an important aspect of conducting scientific research. This term means different things in different teams; in our team we follow these best practices:

Ethical considerations

While we aspire to practice an open model of science, we respect the complex situations that may limit the full openness of our endeavors. We practice situated openness and align our open science goals with the goals of our research and research participants. This means we restrict the sharing of sensitive data, maintain the privacy of research subjects, and aim for transparency over openness.

Authorship + Collaboration

Co-authoring and collaboration are cornerstones of our scientific work. We have an inclusive model of authorship and strive to value all contributions. We have several systems in place to facilitate our work, acknowledge contributions and expand our network to introduce diverse perspectives.

Persistent Identifier (Long-lasting reference to a digital resource)

- We use ORCID to distinguish ourselves from other researchers and manage our identities in different submission systems.

Authorship and Author order

- We commit to conferring authorship to all who meet the criteria and to acknowledging other contributors appropriately with CRediT, Contributor Roles Taxonomy, to document project contributor roles. See example authorship template.
- We discuss author order at the outset of a project and check in throughout the writing process, and determine author criteria based on group consensus. Learn more.

Inclusive science

- We practice inclusive science by thoughtfully considering our citation networks and biases and using bias free language. Learn more.
- We follow a Code of Conduct that establishes positive and prohibited team behaviors. Example Code of Conduct

Articles + Research Materials

We make our articles and research materials as open and accessible as possible to increase the reach and impact of our research.

Preregistration (Specifying your research plan in advance and registering it in a public repository. Reduces bias in hypothesis-testing research. Learn more.)

- We preregister our hypothesis-testing studies in [Open Science Framework/AsPredicted/other]

Methods and Protocols: (Step-by-step documents describing exactly how research was performed. Sharing methods and protocols enables other researchers to reproduce experiments.)

- We publish our methods and protocols in [Protocols.io/other] when the corresponding paper has been [submitted/accepted]

Preprints (Version of a paper made public prior to peer review. Sharing protocols increases the speed of research dissemination. Learn more.)

- We submit preprints of our articles to [bioRxiv/medRxiv/other]

Open Access: (A publishing model where articles are published online with no access restrictions so that anyone can read them)

- We make all of our articles openly accessible either through publishing in open access journals, or by archiving a copy in an open repository like [our institutional repository/Pubmed Central/other]

Theses and Dissertations

- Whenever possible we incorporate open science practices into the thesis writing process.

Presentations

- We make our presentation slides and posters available in [our institutional repository/Zenodo/other] so that they are more easily discoverable and citable.

Data + Code

Research data are the inputs and outputs required to run, evaluate, reproduce, or build upon our analyses and conclusions. This includes "raw" data, processed data, data at intermediate stages, and "final" datasets (i.e. the dataset that underlies a manuscript) as well as any documentation that is needed to make use of these materials. We share our research data and code in public repositories whenever possible.

Documentation

- We create readme documents (or equivalent) to track the data we are creating, the software we are using (including versions) and describe the code we are writing ourselves.

Data

- We use the [Dryad Data Repository/other] to make data and relevant documentation available to others. Find data repositories for your research

Software and Code (Broadly refers to computer programs, packages, and scripts used to work with, analyze, and visualize data.)

- We use [Github/other] for storing code we are writing ourselves and [Zenodo/other] for ensuring it is preserved in a citable form at the conclusion of a project.
- We give back to open source communities and tools that we rely on with labor, donations, and citations to projects and infrastructure.

Communication + Impact

Research Profiles (useful to establish a public scientific persona associated with one's institution, co-authors and larger discipline)

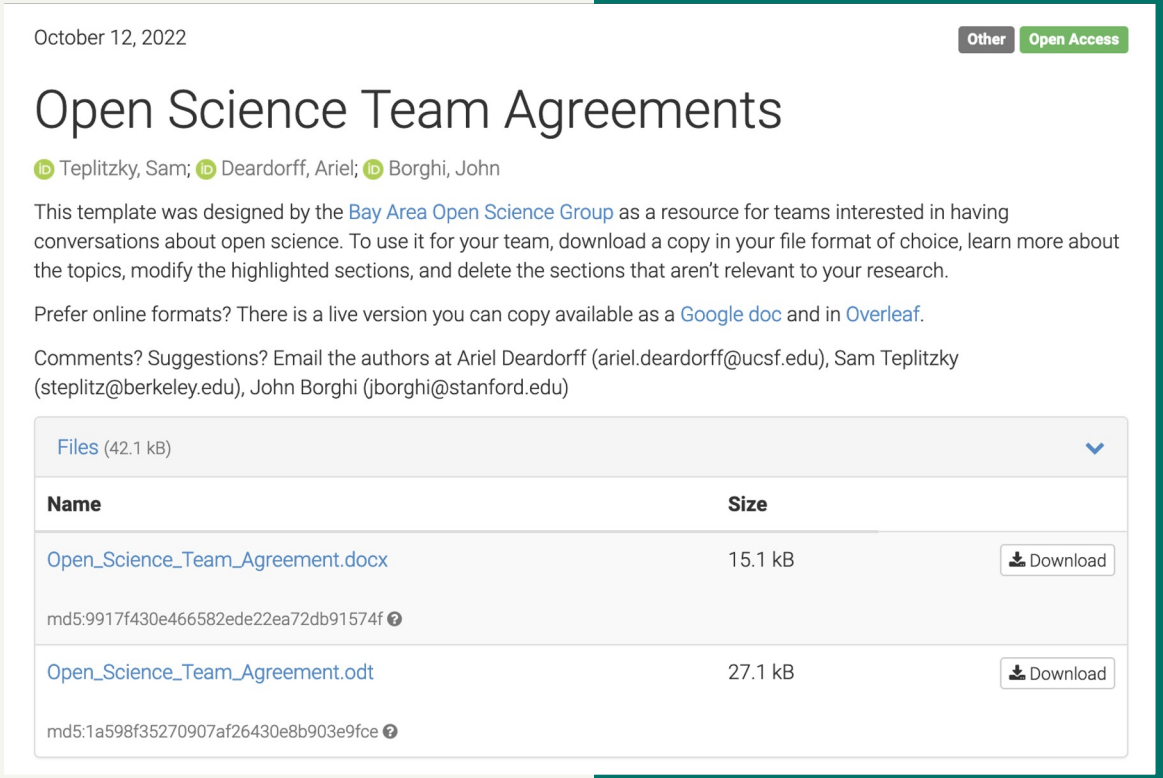
- We create public profiles using [Google Scholar/University System/Other] to track our published or shared work.

Social Media

- We use [University Communications Office/Twitter/Discord/other platform] to communicate our

Shared on Zenodo

389 views, 70 downloads*



*As of July 24

Next Steps: Building Curriculum

- We got a sub-grant from the UCLA IMLS-funded project "Lessons for Librarians in Open Science"
- Will be building an open source lesson based on the Open Science Team Agreements
- Use as an opportunity to pilot templates with more research teams and get feedback

We want to know from you: How should we structure the lesson?

Feedback for Team Agreements

Skim the Open Science Team Agreement Template:
https://zenodo.org/record/7154101

1. Rank topics from most to least prepared to address
2. What would help you adopt this in your work?

Share in Poll Everywhere! **PollEv.com/stem**

Rank these topics from most to least prepared to address:

Authorship and Author Order

Inclusive Science (inclusive citations, code of conducts, etc)

Pre-registering and sharing research methods and protocols

Open access publishing and preprints

Sharing outputs like presentations and dissertations

SEE MORE

What would help you adopt this in your work?

Nobody has responded yet.

Hang tight! Responses are coming in.

Spread the word!

- Share the team agreements with your community.
- Let us know what works and what doesn't.
- Check out our lesson early next year!
- Explore open science communities in your area or pop in to one of our upcoming sessions!

References

- Center for Scientific Collaboration and Community Engagement. (2020) The CSCCE Community Participation Model – A framework for member engagement and information flow in STEM communities. Woodley and Pratt doi:10.5281/zenodo.3997802CSCCE
- Haigh, Susan, and Mary Lee Kennedy. Observations on Research Libraries' Alignment with Institutional STEM Priorities. Association of Research Libraries and Canadian Association of Research Libraries, May 2023. https://doi.org/10.29242/report.stem2023.
- Palumbo, L., Bussmann, J., & Kern, B. (2021). The Value of Subject Specialization and the Future of Science Liaison Librarianship. College & Research Libraries, 82(4), 584. doi:https://doi.org/10.5860/crl.82.4.584
- The Turing Way Community, & Scriberia. (2023). Illustrations from The Turing Way: Shared under CC-BY 4.0 for reuse. Zenodo. https://doi.org/10.5281/zenodo.7587336
- UNESCO Recommendation on Open Science; https://unesdoc.unesco.org/ark:/48223/pf0000379949

Thank you!

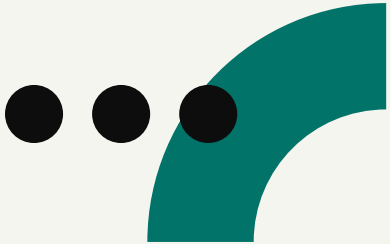
Learn More:

Open Science Team Agreements Template
Bay Area Open Science Group Website
Bay Area Open Science Group 2022-23 Reflection Slides - http://ucberk.li/stemlib-slides

Questions?

Sam: samteplitzky@berkeley.edu
Ariel: ariel.deardorff@ucsf.edu

Credits



Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Pexels