Strategies for improving openness and reproducibility

Andrew Sallans

Center for Open Science

http://cos.io/

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Expanding Public Access to the Results of Federally Funded Research

FEBRUARY 22, 2013 AT 12:04 PM ET BY MICHAEL STEBBI

Summary: The Obama Administration i
to the results of research their tax dollar
today, OSTP Director John Holdren ha
expenditures to develop plans to make t
public—generally within one year of pub

The Obama Administration is committed
the results of scientific research their tax
memorandum released today, OSTP Direc
more than $100M in R&D expenditures to
funded research freely available to the pu
researchers to better account for and mar
scientific research. OSTP has been looking
input on multiple occasions and convenin
final policy reflects substantial inputs fro
members of Congress, and other member
signed a *We the People* petition asking for
funded research.

To see the new policy memorandum, plea
visit: http://www.whitehouse.gov/sites/

To see Dr. Holdren's response to the *We t*
visit: https://petitions.whitehouse.gov/re
research

Michael Stebbins is Assistant Director for Bi

THE IRAN DEAL

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nature International weekly journal of sci

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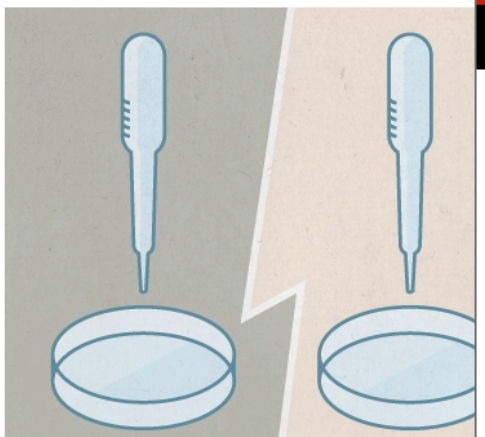
SPECIAL



CHALLENGES IN IRREPRODUCIBLE RES

Science moves forward by corroboration – when research
advances faster when people waste less time pursuing fal
considered to be the final word, but there are too many tha

There is growing alarm about results that cannot be reproc
levels of scrutiny, complexity of experiments and statistics,
Journals, scientists, institutions and funders all have a part
taken substantive steps to improve the transparency and r
promote awareness within the scientific community. We ho
collection will help.

▾ Survey ▾ Editorial ▾ Features ▾ News and ana

▾ Perspectives and reviews

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SHARE

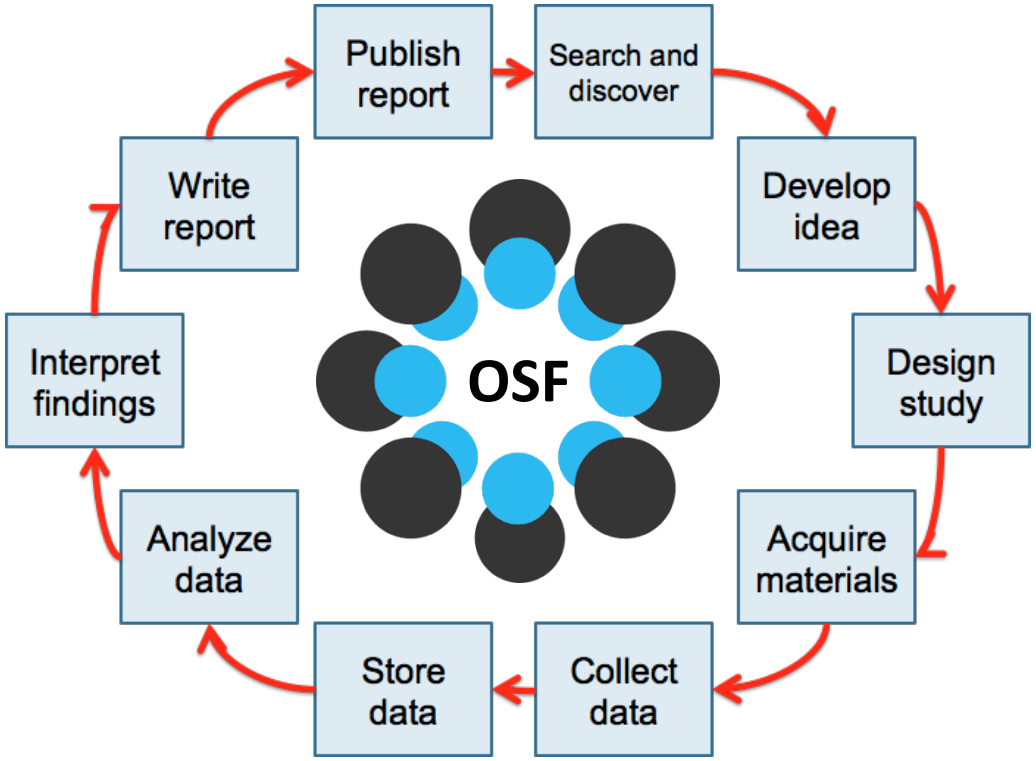
Horizon 2020: A €80 Billion Battlefield for Open Access

By Jop de Vrieze | May. 24, 2012 , 12:10 PM

As negotiations proceed to shape the next installment of Europe's gargantuan research funding programs, scientists, librarians, and publishers are eagerly awaiting the answer to a critical question: How strong will the new 7-year program, called Horizon 2020, be on Open Access (OA)?

The European Commission has said that making the research it funds widely available is one of its priorities; its **proposal for the rules of participation and dissemination in Horizon 2020** says that the program will have "dedicated support to dissemination (including through open access to research results), communication and dialogue actions" and that "open access shall apply under the terms and conditions laid down in the grant agreement." Last week, the commission's director-general of research and innovation at the commission, Robert-Jan Smits, said in **an interview** in the *Times Higher Education* that open access, which typically involves making research papers freely available within months or a year of publication, "will be the norm" for research funded through Horizon 2020. "With our €80 billion we can make one hell of a difference," Smits said.

What that will mean exactly is still unclear, however, and the topic of much lobbying and speculation. OA advocates say a clear mandate to make all E.U.-funded papers publicly available would be hugely significant, and would be another step in what they hope is a complete transition to OA. "We very much welcome" Smits's comments, says Alma Swan, Director of European Advocacy of SPARC, an international alliance of academic and



More than just data access, sharing, and compliance

Norms	Counternorms
Communality Open sharing	**Secrecy** Closed
Universalism Evaluate research on own merit	**Particularlism** Evaluate research by reputation
Disinterestedness Motivated by knowledge and discovery	**Self-interestedness** Treat science as a competition
Organized skepticism Consider all new evidence, even against one's prior work	**Organized dogmatism** Invest career promoting one's own theories, findings
Quality	**Quantity**

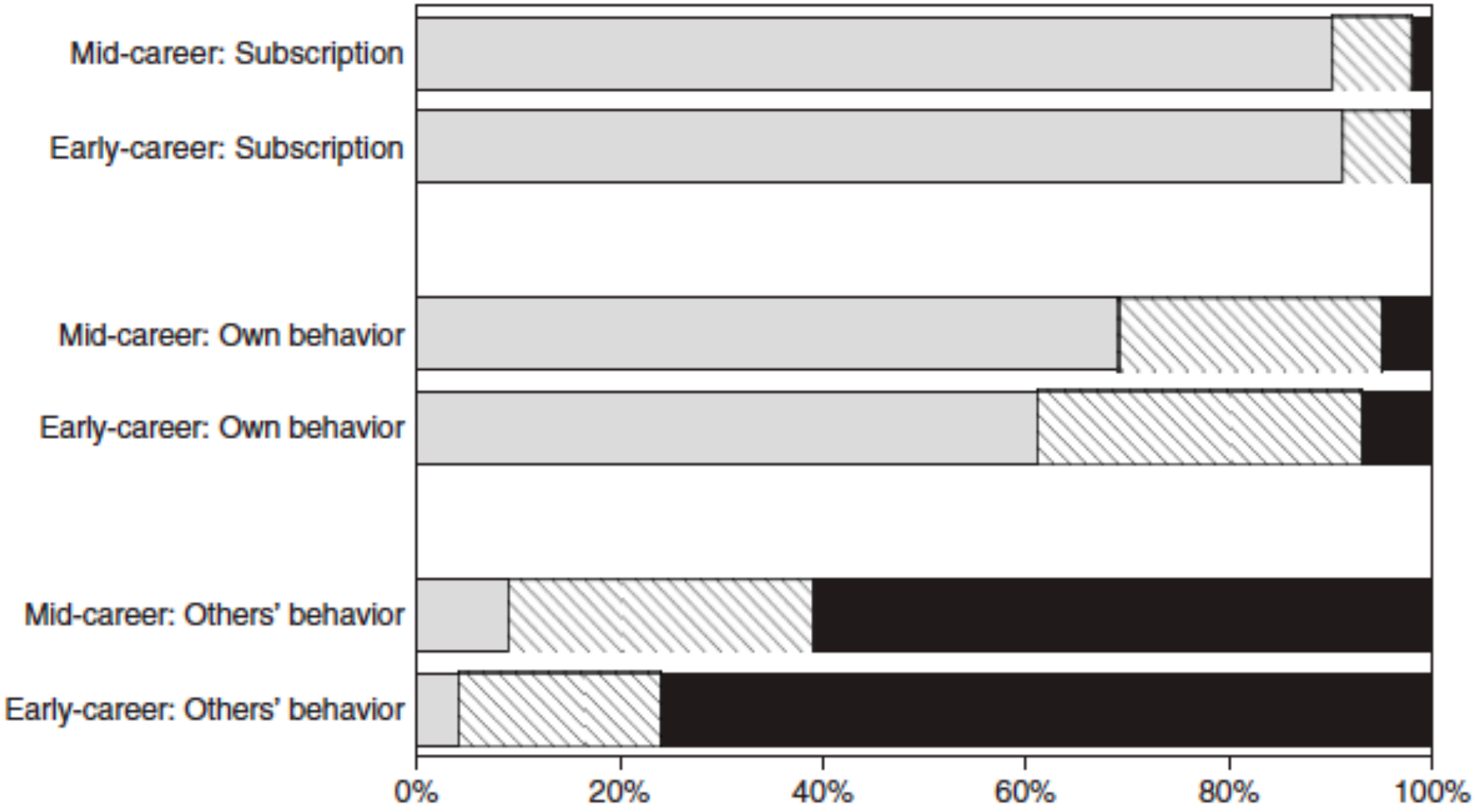


FIG. 3. Norm versus Counternorm Scores: Percent with Norm > Counternorm (dotted), Norm = Counternorm (striped), Norm < Counternorm (solid).

Anderson, Martinson, & DeVries, 2007

Technology to *enable* change

Training to *enact* change

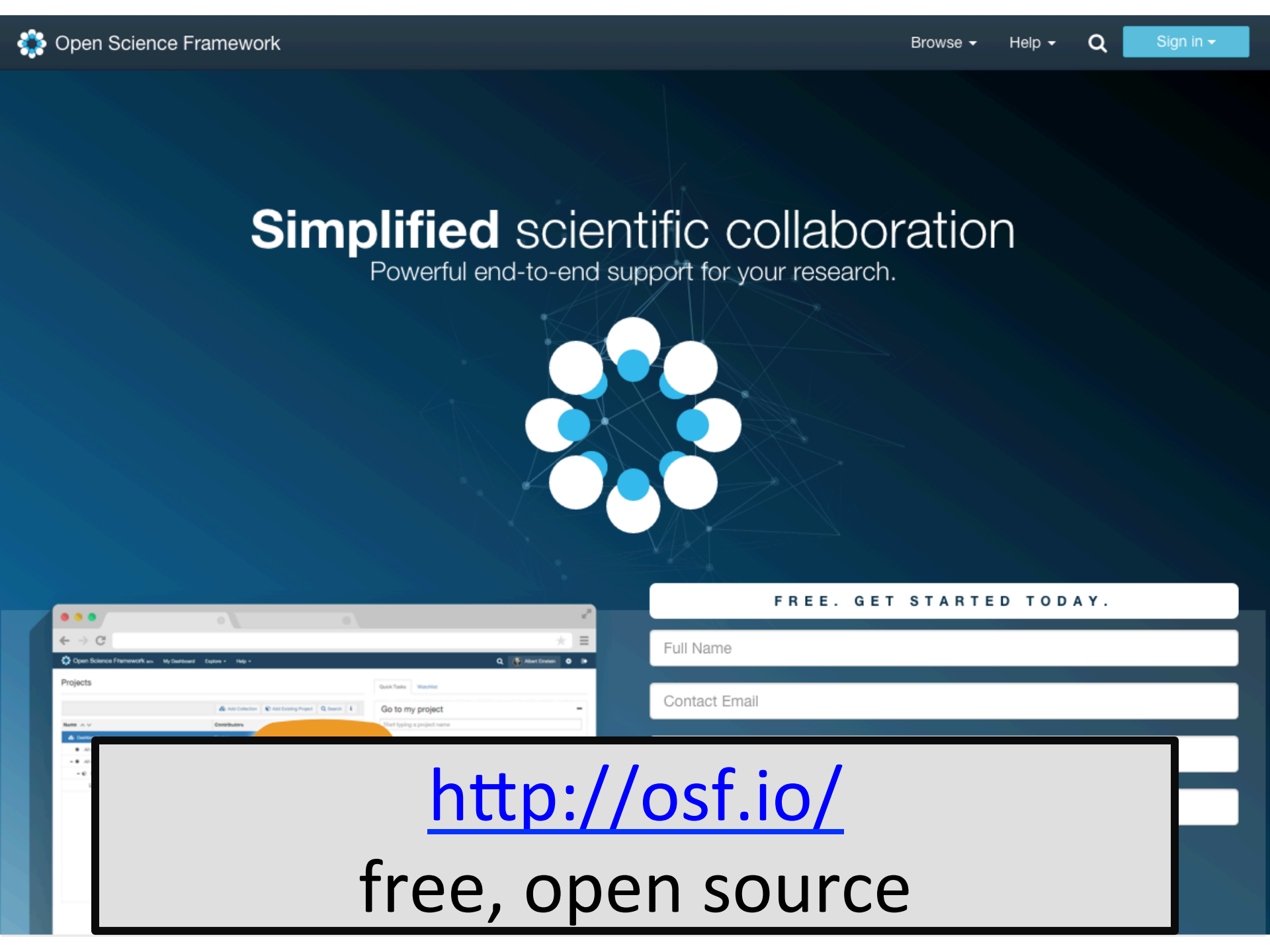
Incentives to *embrace* change

Free

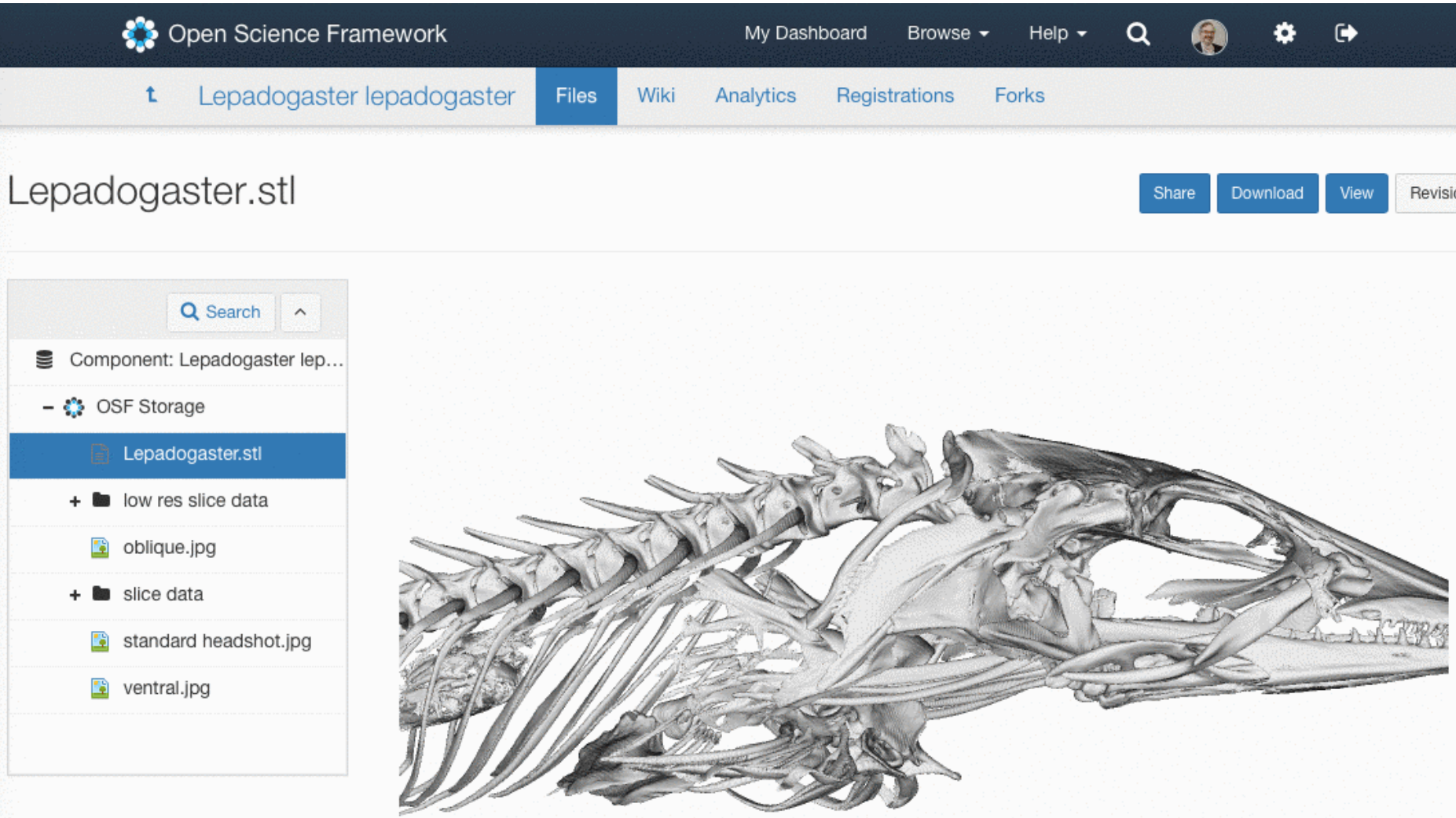
Open

Inclusive

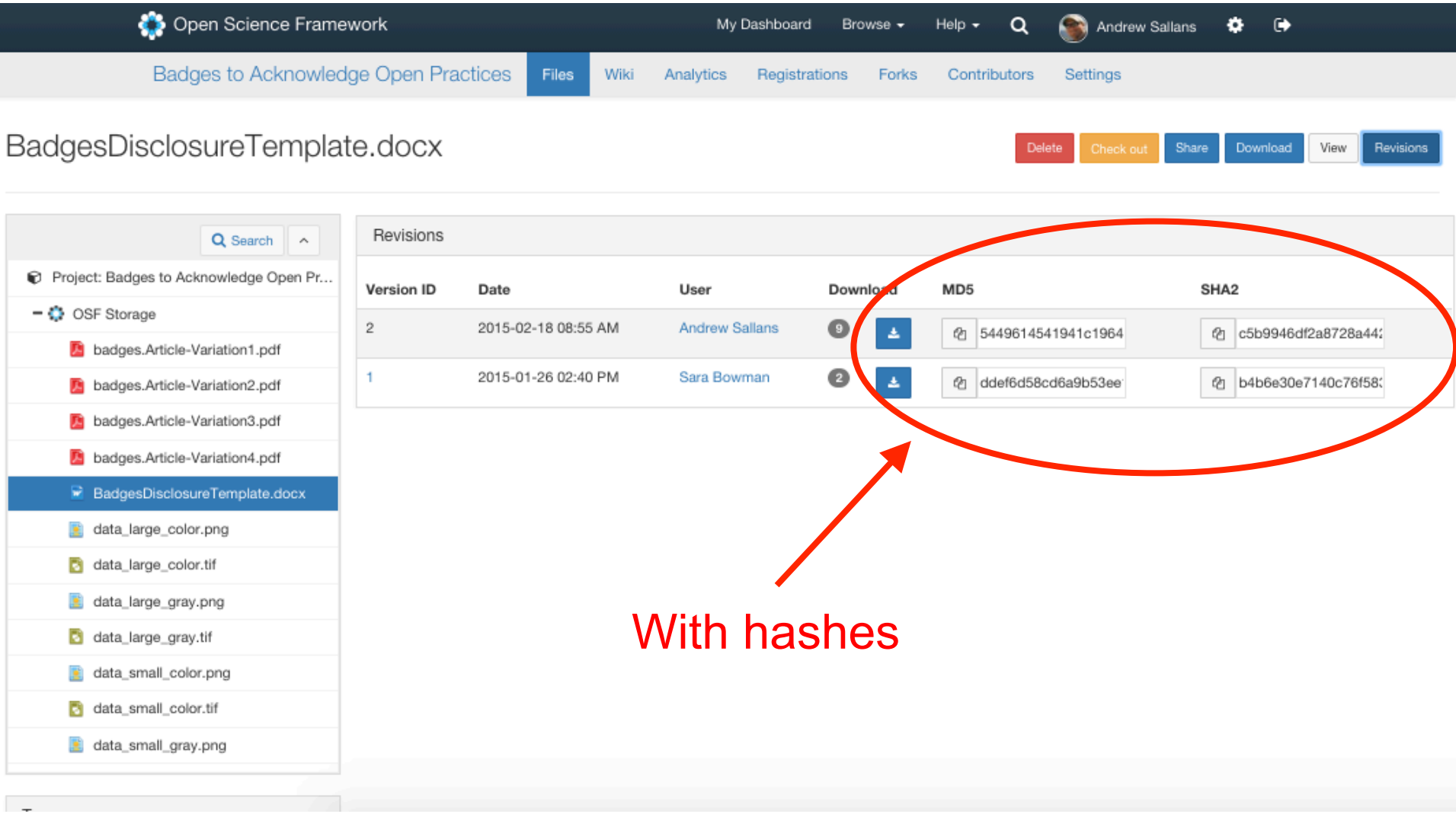
Technology to *enable* change


Open Science Framework
Browse
Help
Sign in
Simplified scientific collaboration
Powerful end-to-end support for your research.
FREE. GET STARTED TODAY.
Full Name
Contact Email
Projects
Go to my project
http://osf.io/
free, open source

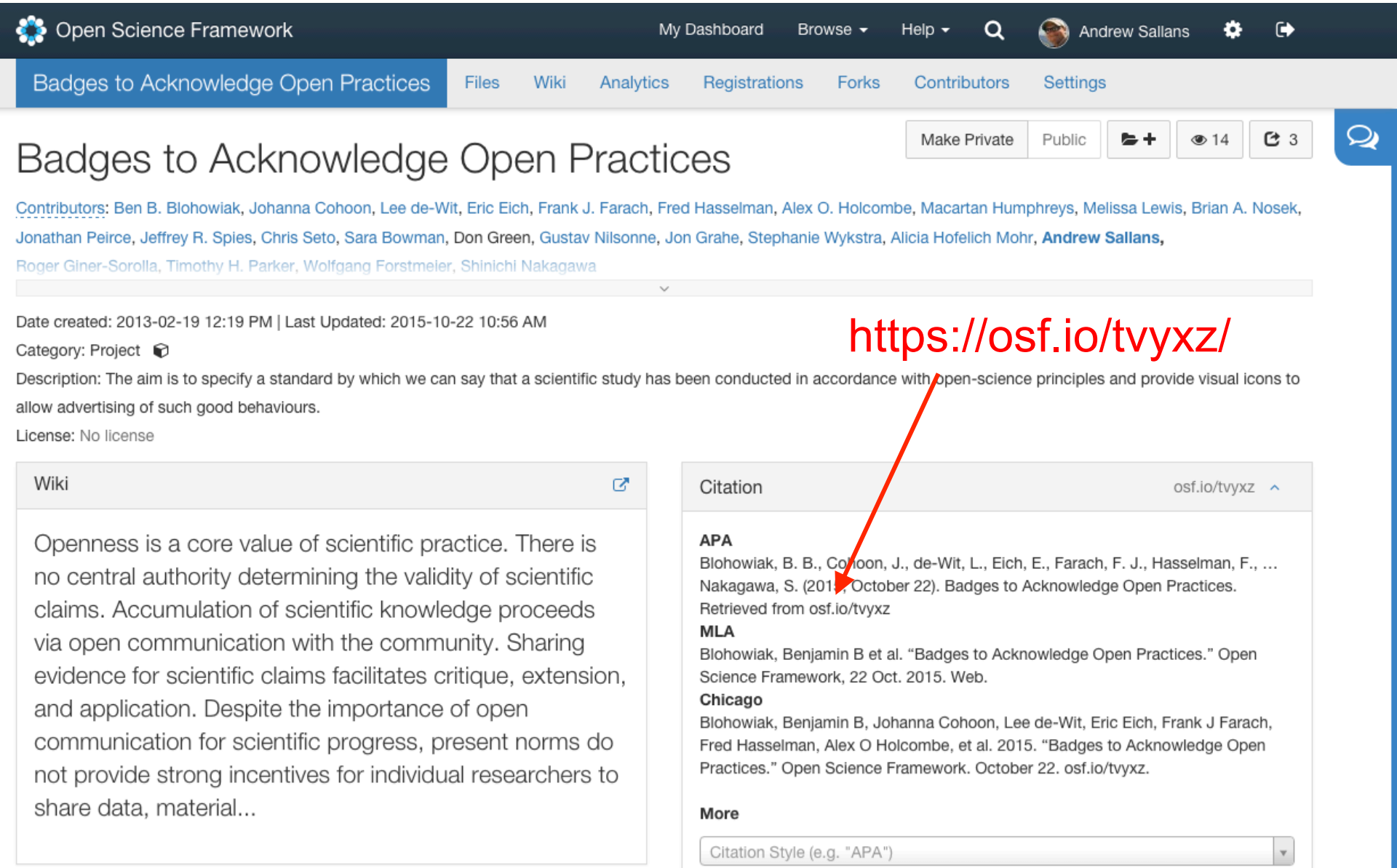
Put data, materials, and code on the OSF



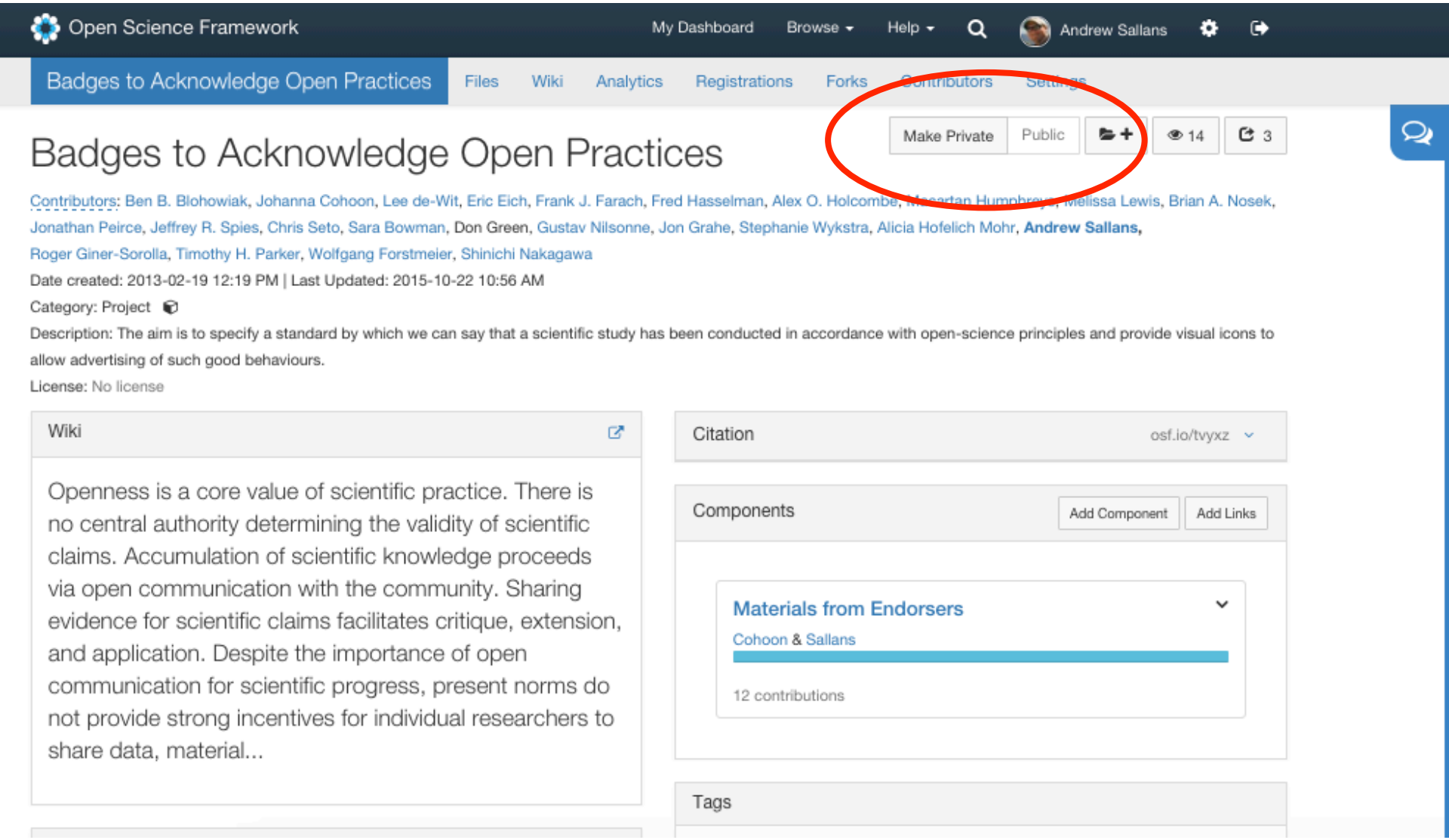
Automate versioning



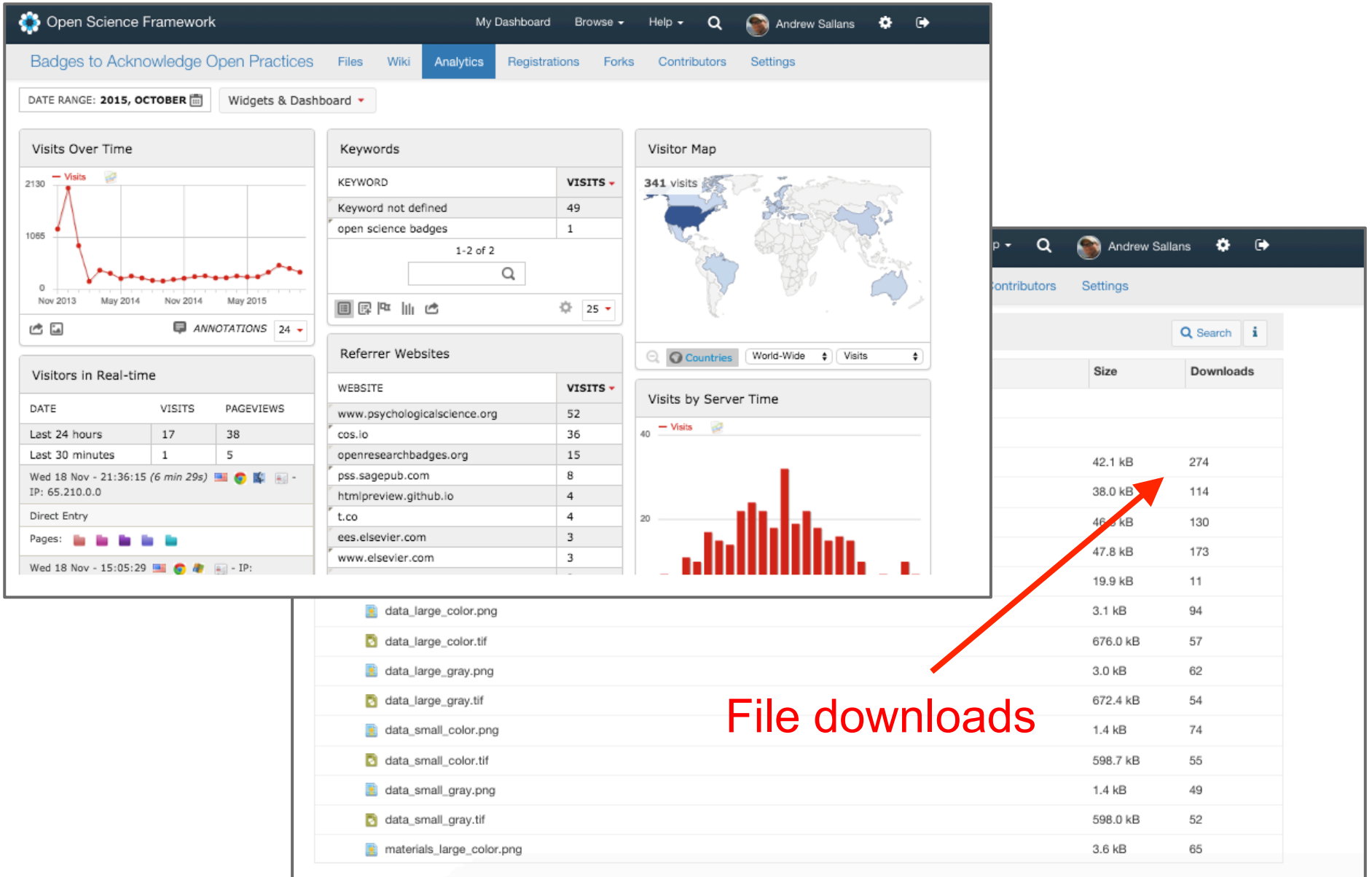
Get a persistent identifier

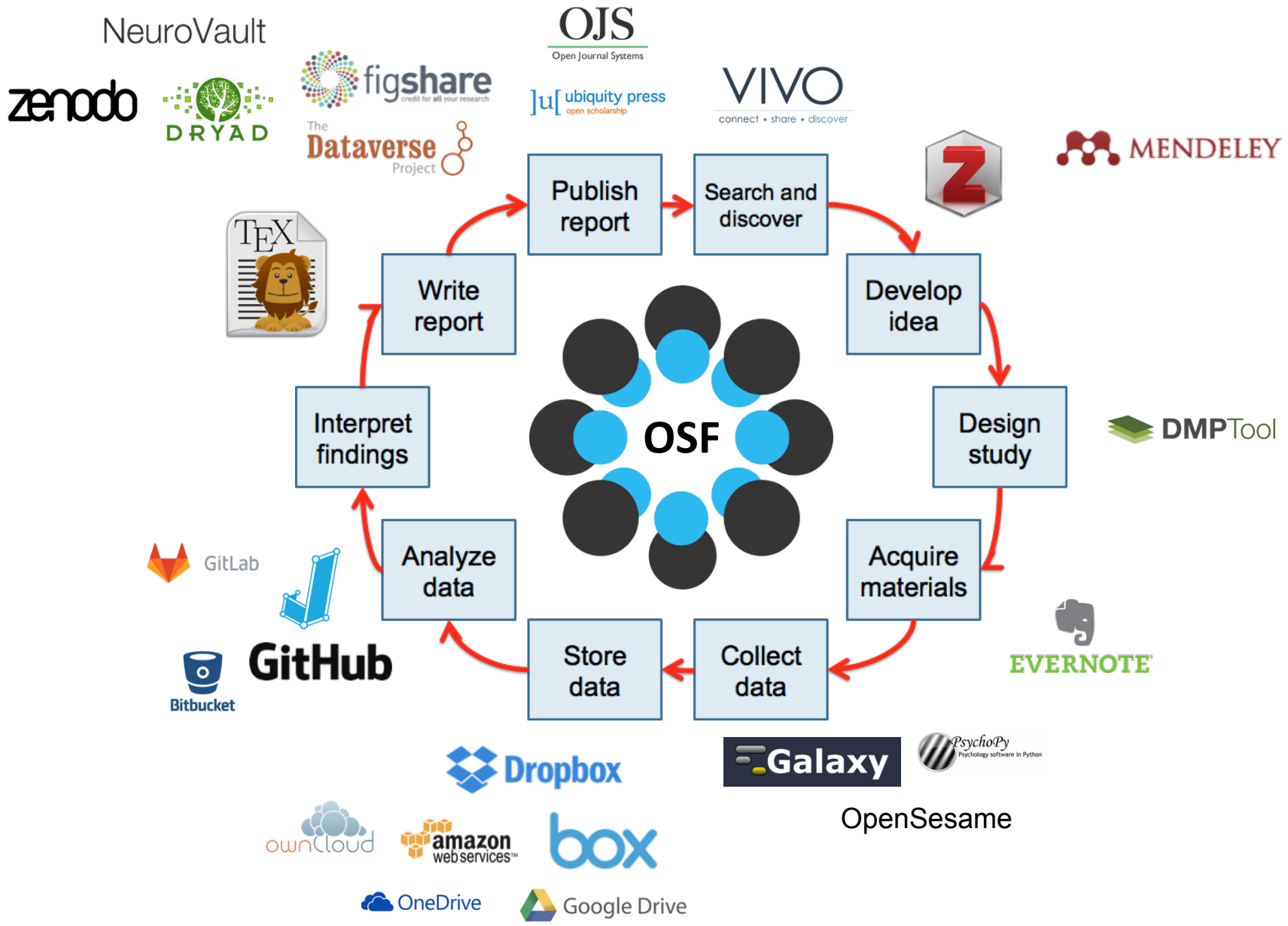


Share your work



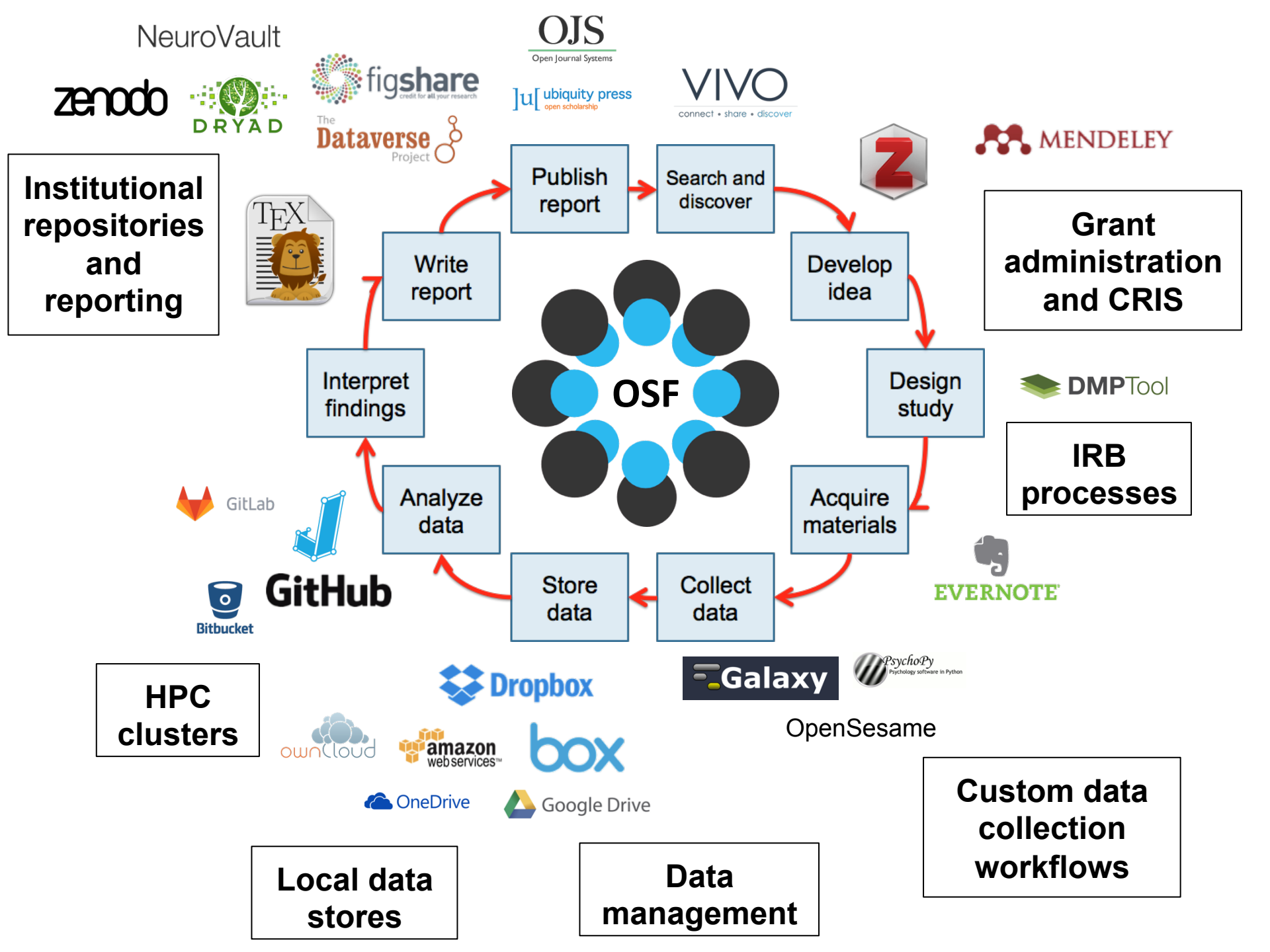
See the impact





29 grants to develop open tools and services: https://cos.io/pr/2015-09-24/

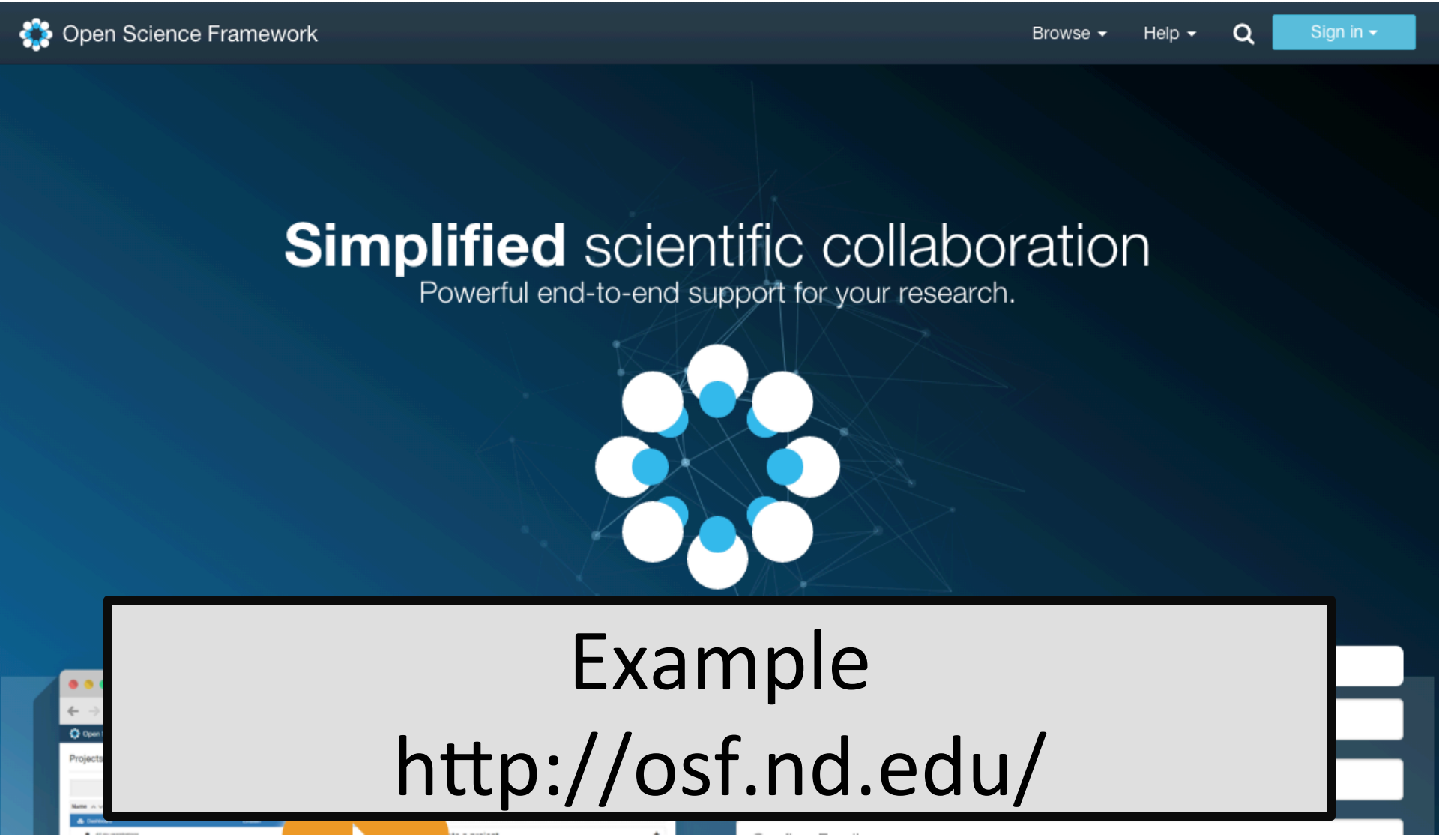
Connecting the workflow
is critical to *enabling change*


NeuroVault
zenodo
DRYAD
figshare
The Dataverse Project
OJS
Open Journal Systems
ubiquity press
VIVO
connect • share • discover
MENDELEY
Institutional repositories and reporting
Grant administration and CRIS
Publish report
Search and discover
Develop idea
Design study
Acquire materials
Collect data
Store data
Analyze data
Interpret findings
Write report
OSF
DMPTool
IRB processes
GitLab
GitHub
Bitbucket
EVERNOTE
HPC clusters
Dropbox
Galaxy
PsychoPy
OpenSesame
ownCloud
amazon web services
box
OneDrive
Google Drive
Local data stores
Data management
Custom data collection workflows

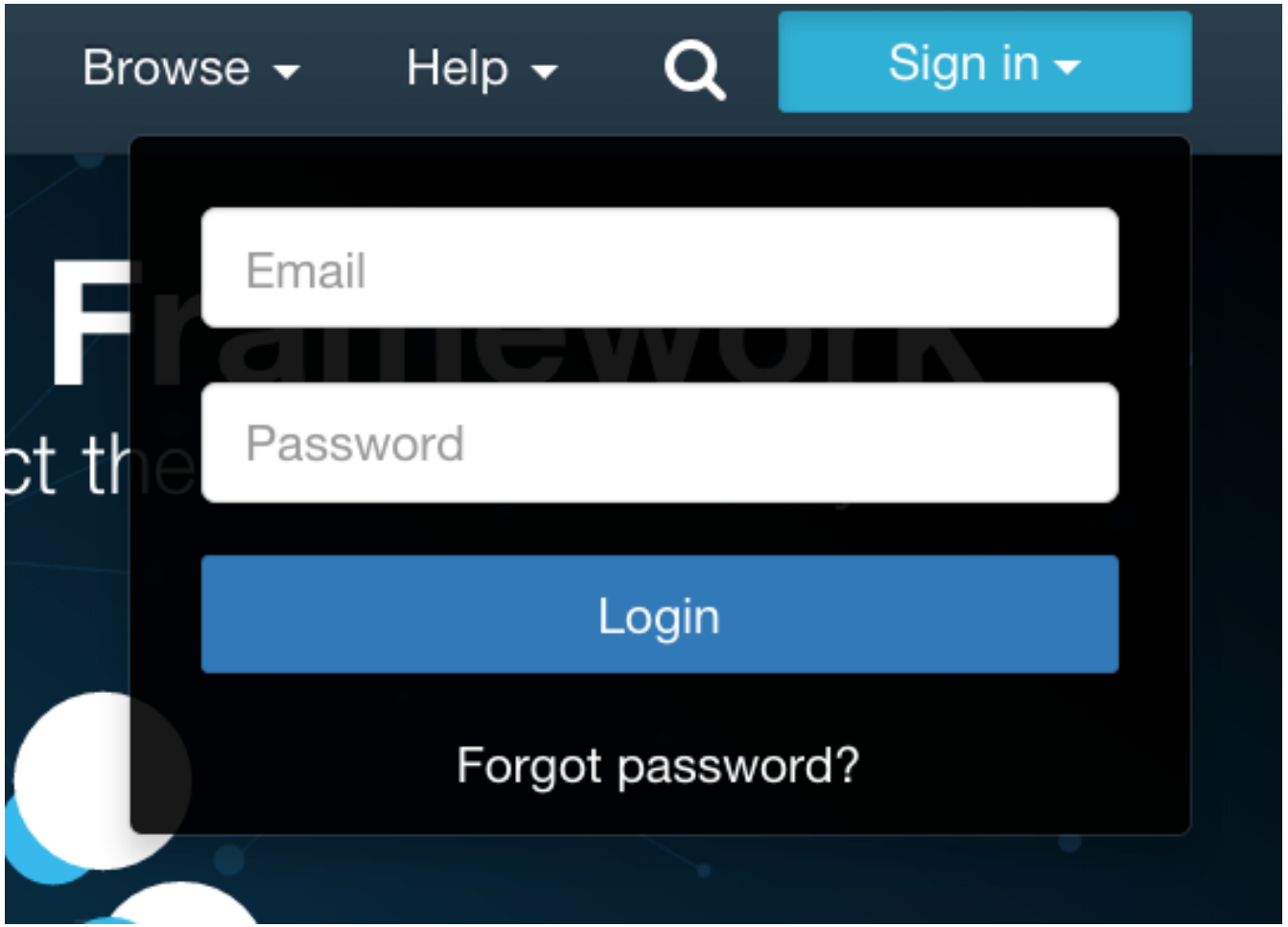
OSF for Institutions

Joint development with:

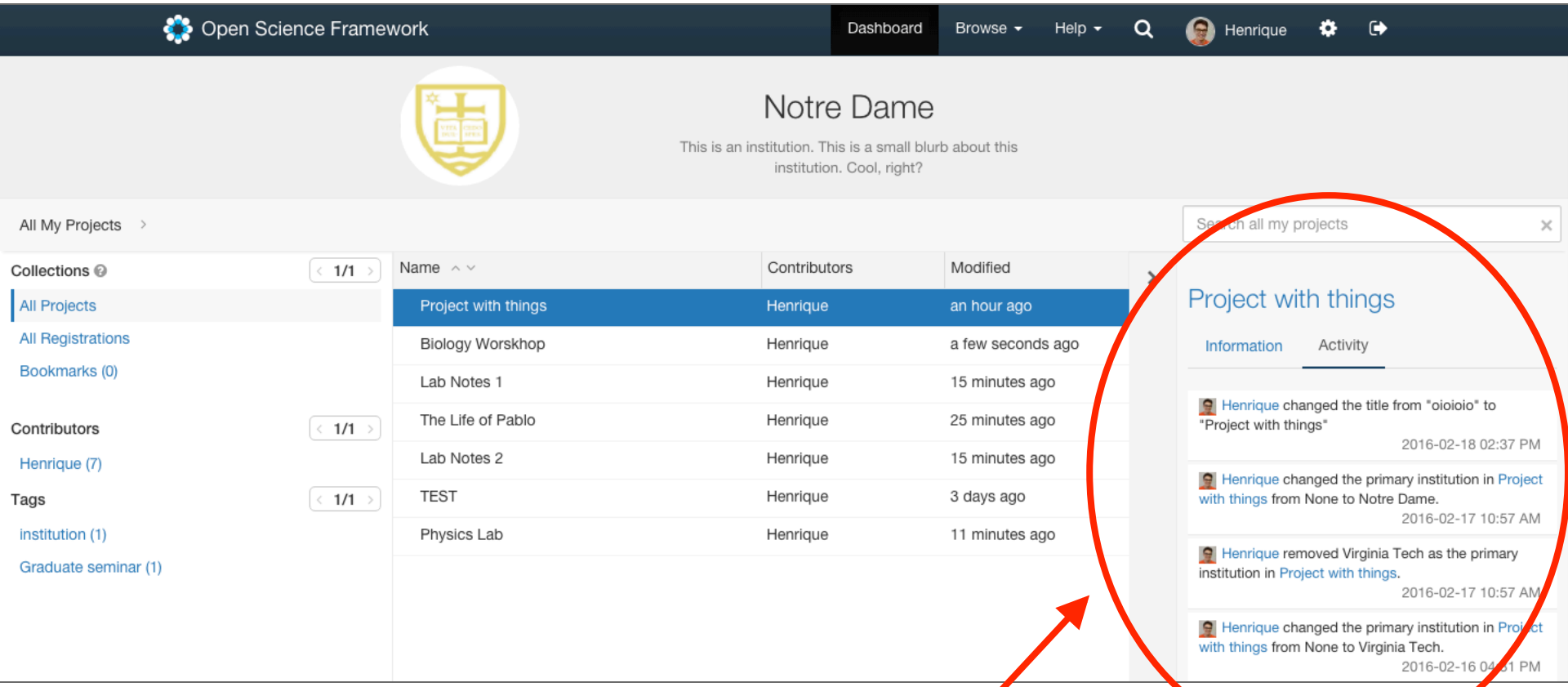
Custom urls for institutions



Integrated authentication and affiliation

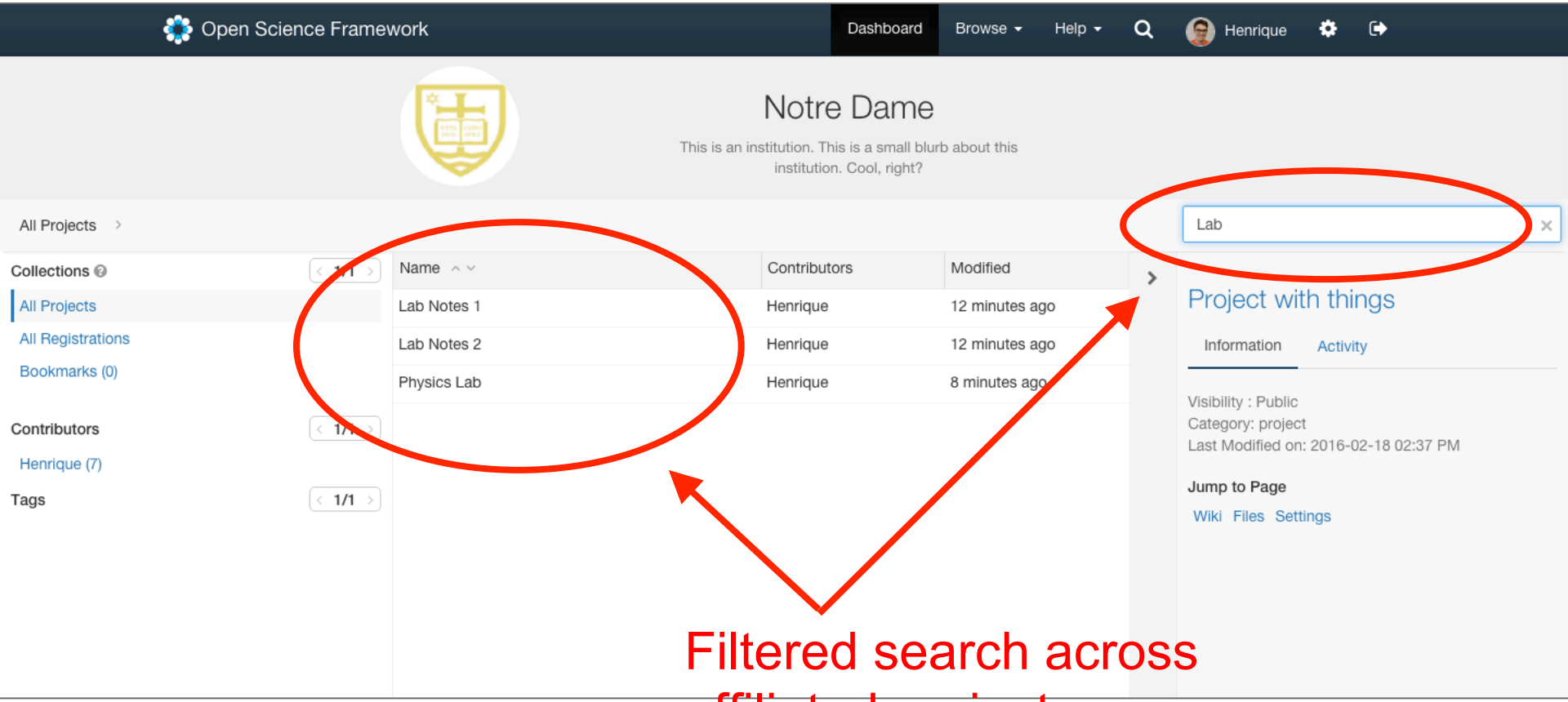


Institutional landing pages



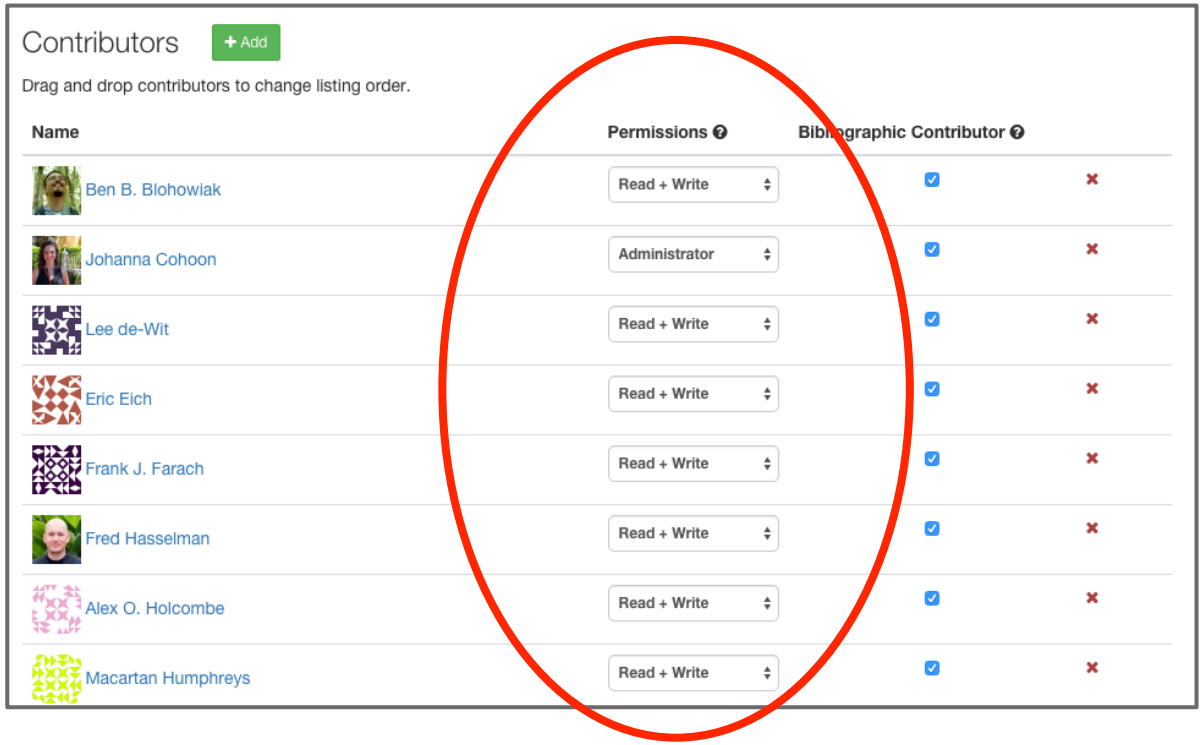
Workflow activity across all affiliated projects

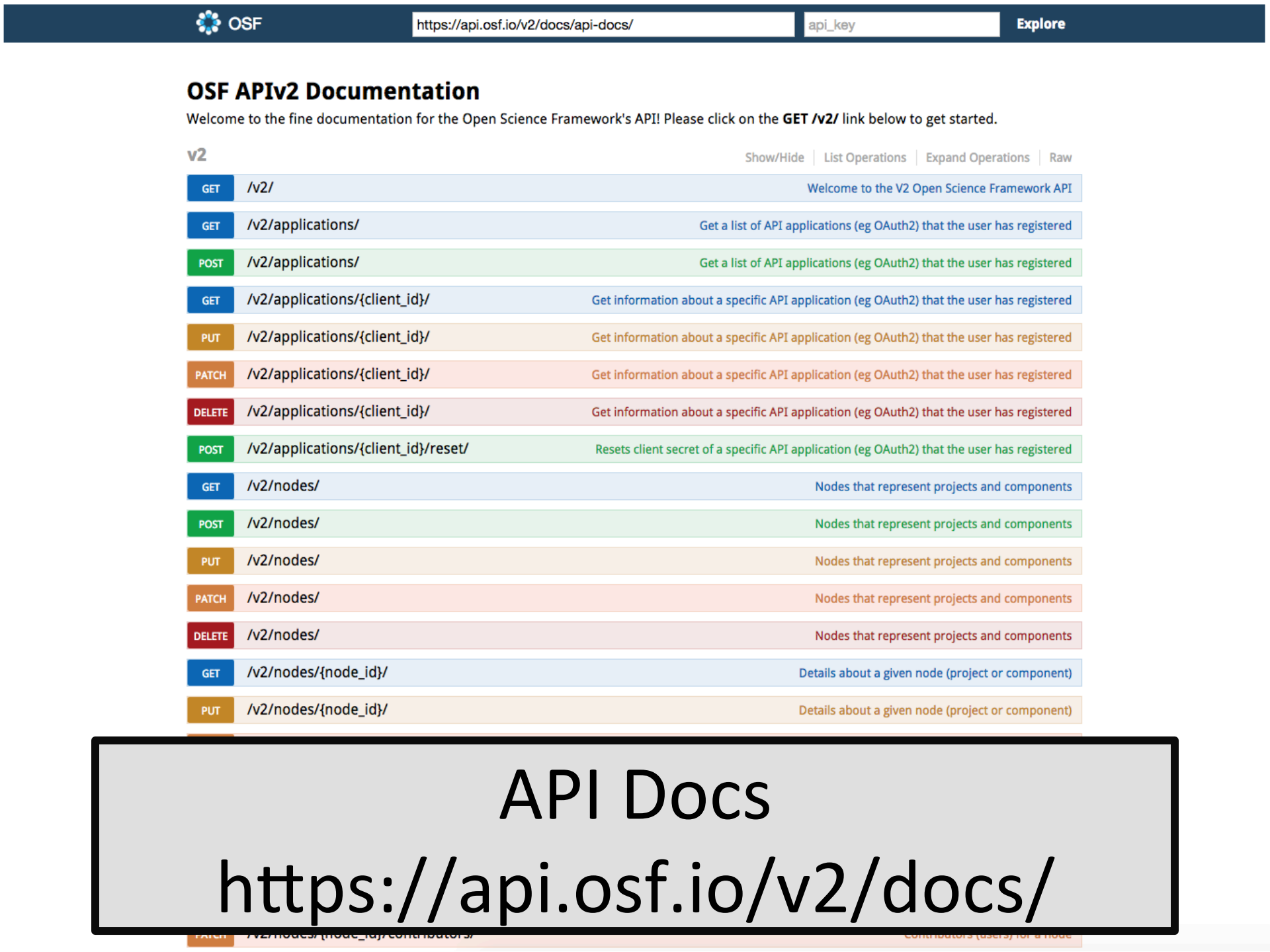
Institutional affiliation on project pages



Group permissions (in later release)

- Groups are collections of users
- Ability to apply a group to a project and specify permissions
- Changes to groups are inherited by projects





API Docs

https://api.osf.io/v2/docs/

Training to *enact* change

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Scientists can improve the replicability of their own work through careful documentation, adherence to standards, and the use of open tools. We answer questions and provide training on open and reproducible tools, methodologies, and workflows. Some examples:

- ✔Using R
- ✔Conducting power analyses
- ✔Using the OSF
- ✔Learning Github
- ✔Conducting meta-analyses
- ✔Preregistering analysis plans

This service is provided in partnership with the Berkeley Initiative for Transparency in the Social Sciences (BITSS)

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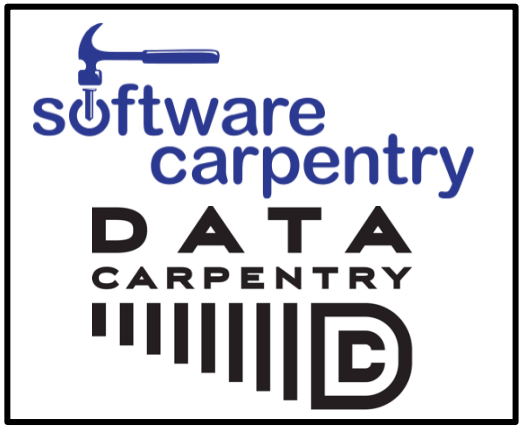
Free training on how to make research more reproducible

http://cos.io/stats_consulting



COS Statistical and Methodological Consulting /

Online Materials

Contributors: Courtney Soderberg, Geneva T. Dodson

Date created: 2015-04-19 06:31 PM | Last Updated: 2016-01-24 11:25 PM

Category: Project

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Wiki

This project contains all the materials (slidedecks, code, examples, etc.) related to the materials posted on the Center for Open Science's youtube channel. Below is an index of all the current material.

- Confidence Intervals
  - Intro to Calculating Confidence Intervals
  - Confidence Intervals for ANOVAs
- Power
  - Consequences of underpowered studies
  - Intro to Power in R
  - Repeated Measures ANOVA in G*Pow...

Citation

Components

Intro to Power

Soderberg

13 contributions

Consequences of Low Statistical Power

Center for Open Science

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Incentives to *embrace* change

Transparency and Openness Promotion (TOP) Guidelines

Low barrier to entry

Modular

Agnostic to discipline

TOP Guidelines

http://cos.io/top

1. Data citation
2. Design transparency
3. Research materials transparency
4. Data transparency
5. Analytic methods (code) transparency
6. Preregistration of studies
7. Preregistration of analysis plans
8. Replication

TOP Signatories

Journals, Organizations, Funders

Endorsement of principles + commitment to review for adoption

Over
538 journals
+
58 orgs

Science Advances AAAS

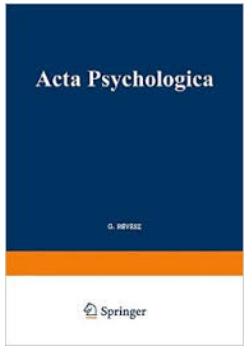
Cortex
A journal devoted to the study of the nervous system and behavior

Geophysical Research Letters

ljaf
laura and john arnold foundation

THE ROYAL SOCIETY

Science
AAAS



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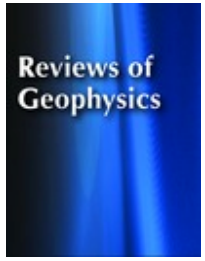

AGU
American Geophysical Union

BITSS
Berkeley Initiative for Transparency in the Social Sciences

WILEY

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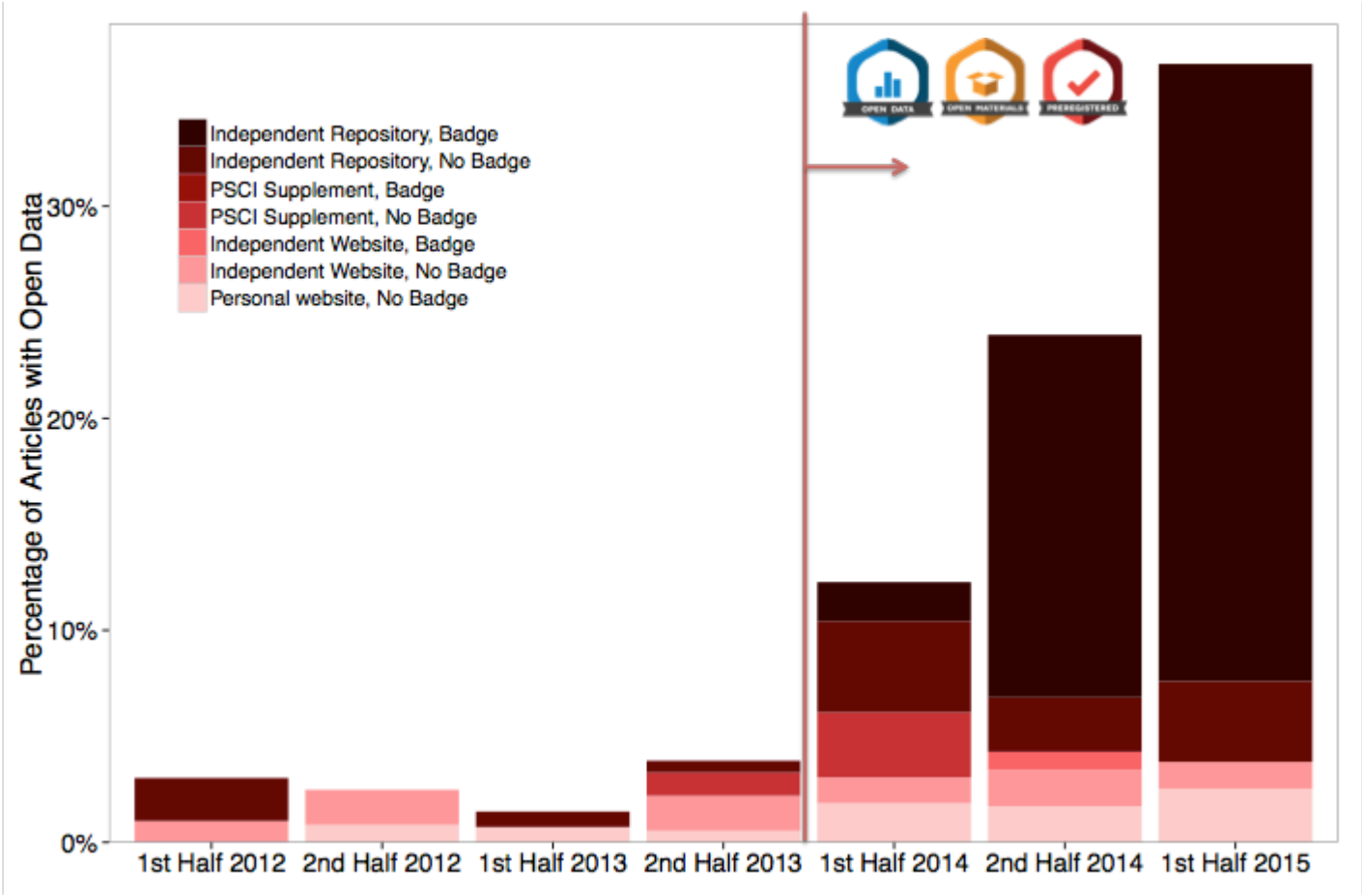
Signals: Making Behaviors Visible Promotes Adoption

Data Availability in *Psychological Science*

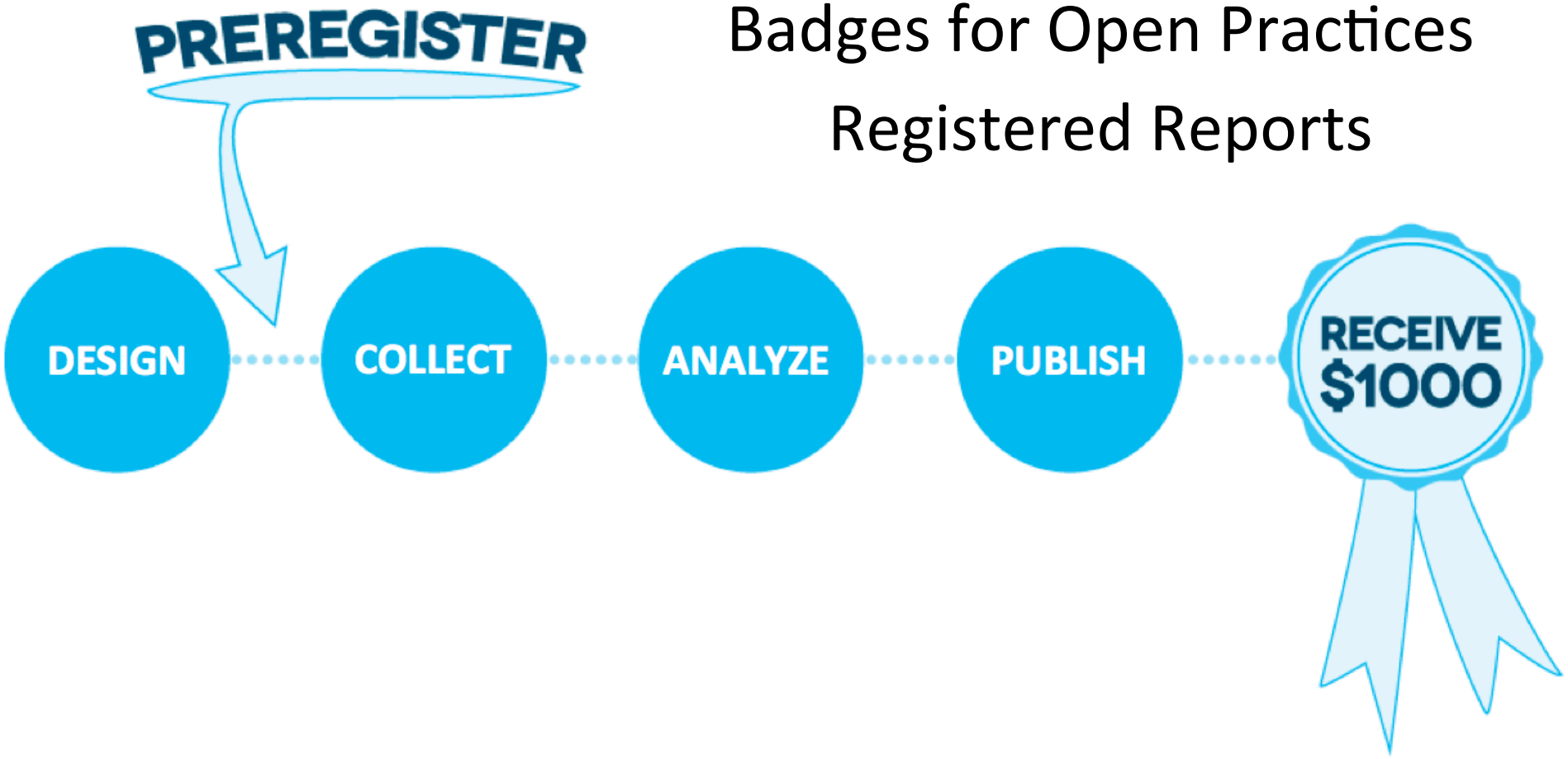


The $1,000,000 Preregistration Challenge

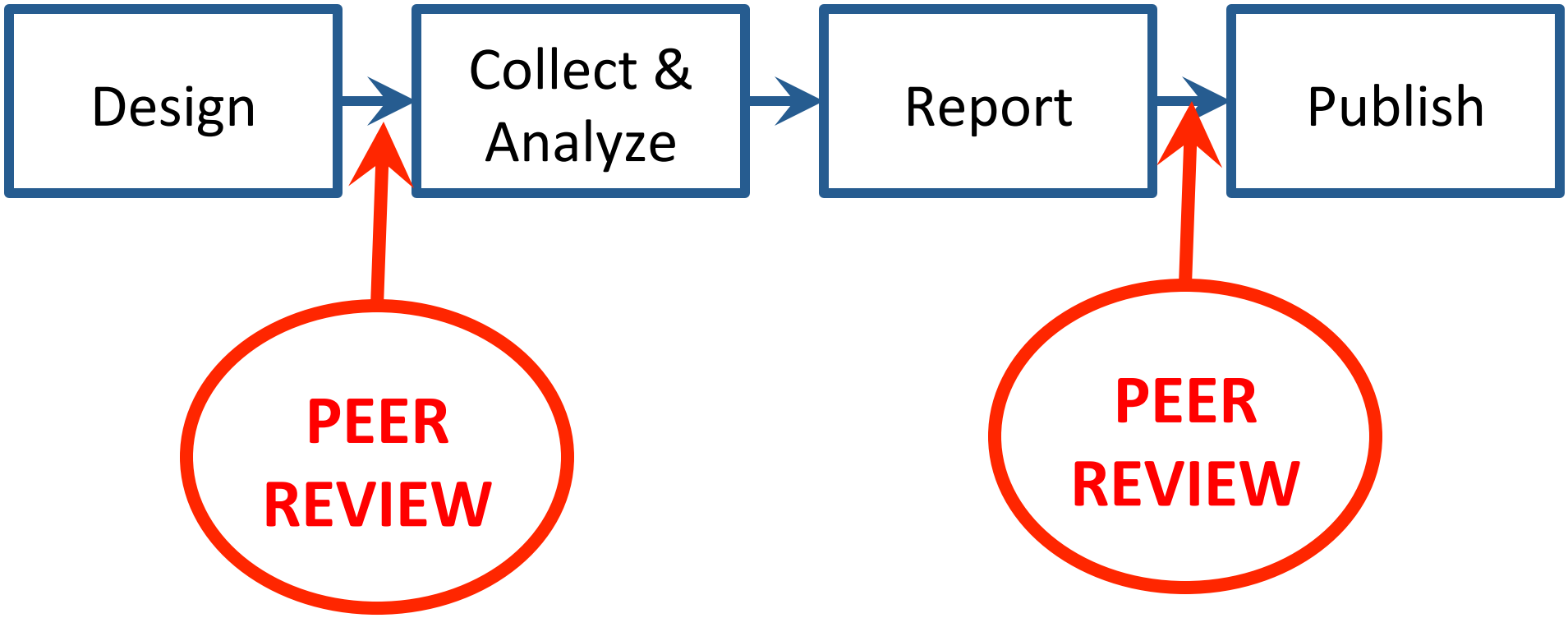
Endorse TOP Guidelines

Badges for Open Practices

Registered Reports



Registered Reports



What can *you* do?

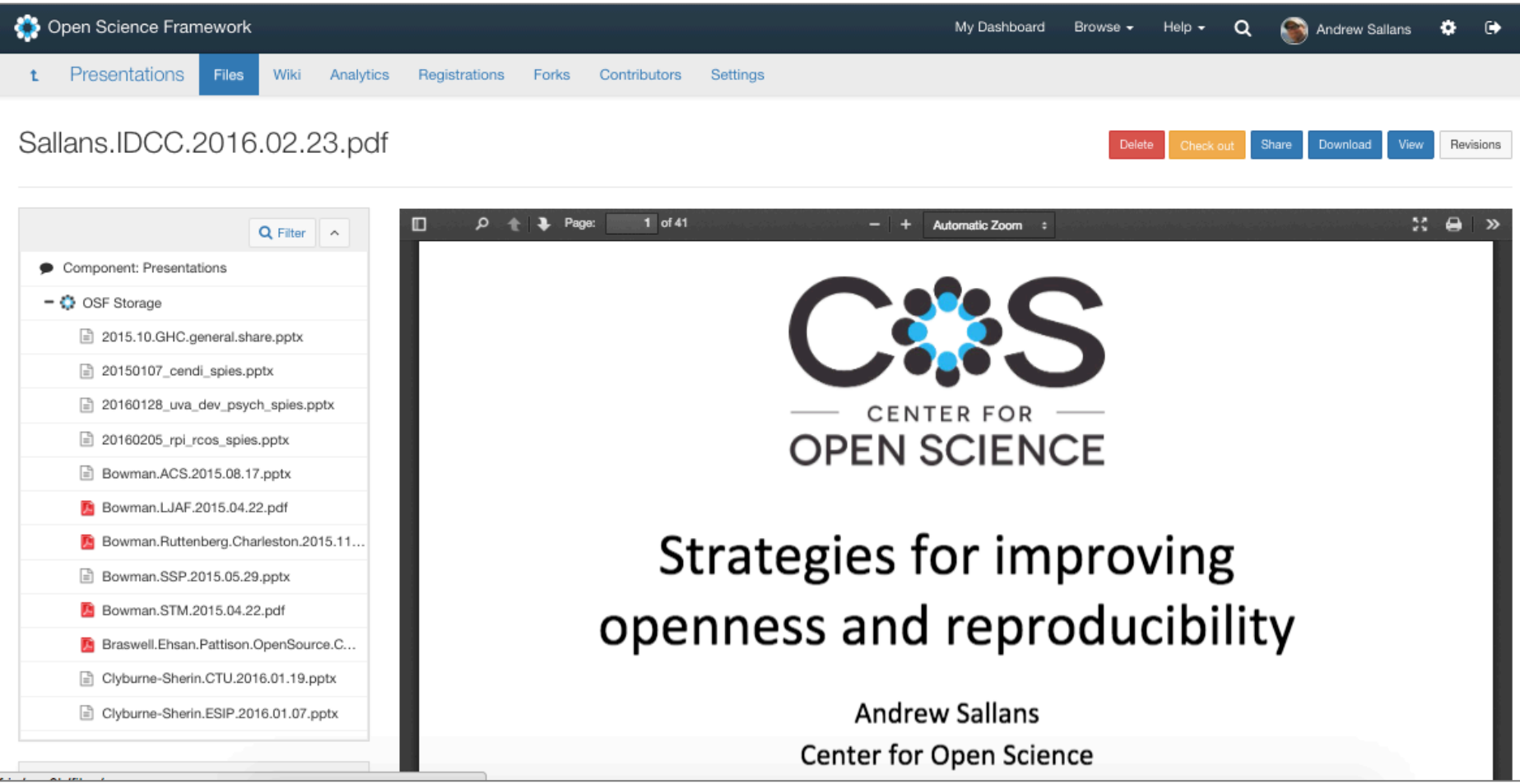
Connect your services to make it *easier* to be more open and reproducible

Meet researchers where they are and help them find *immediate benefit* in training

Partner with us to promote incentives that help *realign* values and practices

Find this presentation at

https://osf.io/wvd7n



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