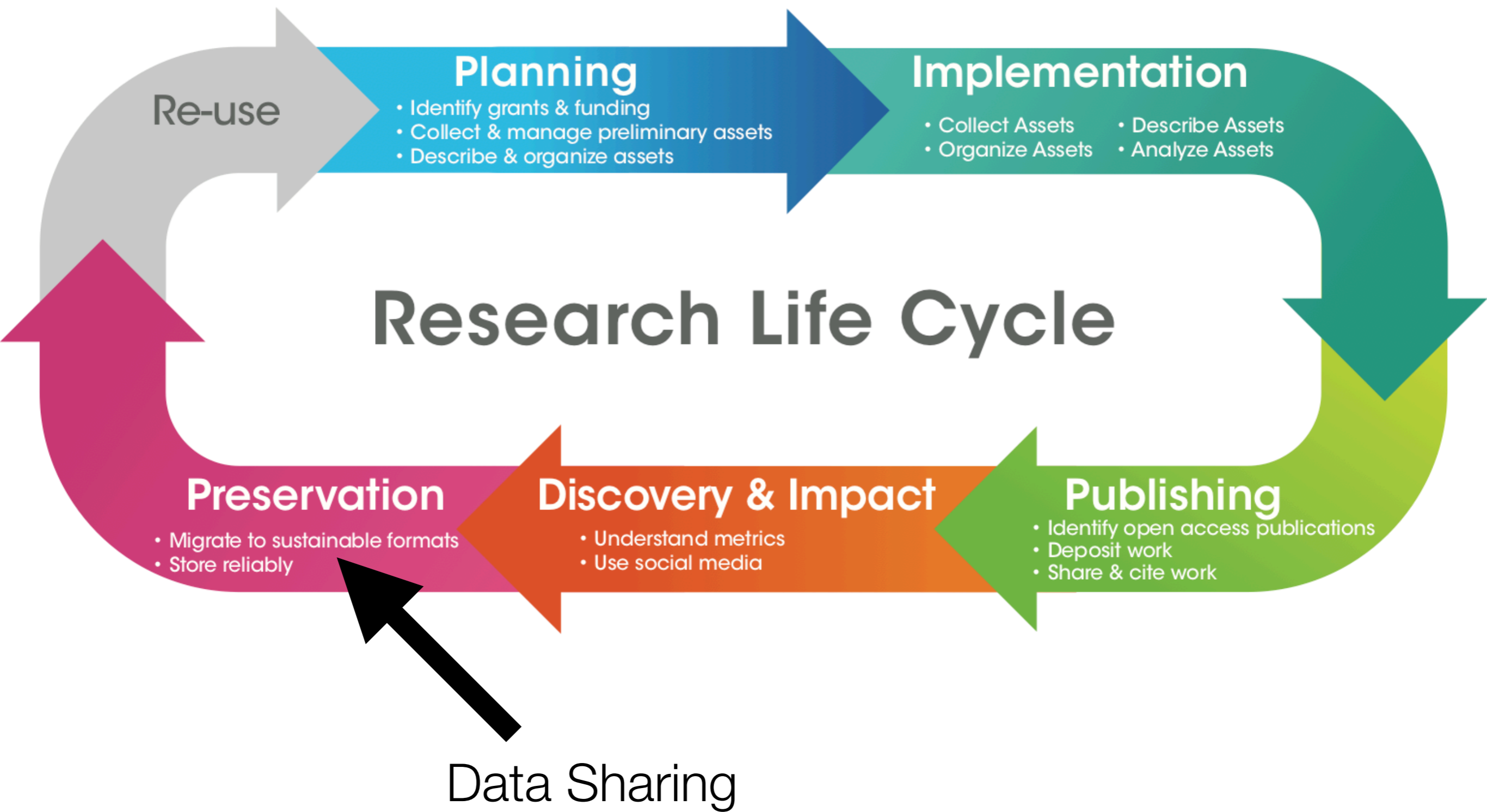


FAIR principles for sharing research data and code

Suzanne T Witt, PhD
25 September 2023



What constitutes “data sharing”?

1. Sharing the raw data + meta data
2. Sharing statistical results
3. Sharing code
4. Publishing detailed methods

Amazing Vegetable Pizza

★★★★★

Every night can be pizza night, if you ask me. Just throw whatever vegetable leftovers you have on there and enjoy!

Course	Pizza
Cuisine	Italian
Keyword	Vegetarian
Allergen	Fish Free, Peanut Free
Prep Time	15 minutes
Cook Time	15 minutes
Resting Time	30 minutes
Total Time	1 hour
Servings	2 pizzas
Calories	482kcal
Author	Brecht

Equipment

- [Pizza Peel](#)
- [Rolling Pin](#) (optional)
- [Pizza Cutter](#) or [scissors](#)

Ingredients

Pizza Dough


- 250 ml water lukewarm
- 500 g all-purpose flour
- 1 tsp instant yeast
- 1 tsp salt
- 1 tsp sugar

Pizza Toppings

- red sauce
- 0.25 red onion
- 0.25 green pepper
- 0.25 red pepper
- rosemary

Instructions

1. Combine the water, yeast and sugar in a bowl. Rest for 5 minutes.
250 ml water, 1 tsp instant yeast, 1 tsp sugar
2. Combine the flour and salt.
500 g all-purpose flour, 1 tsp salt
3. Add the yeast mixture and knead until you get a soft ball.
4. Place in a bowl and cover. Let rise for 30 minutes.
5. Divide the dough and form pizzas.
6. Top the pizzas with sauce and vegetables, cook for 15 minutes on the pizza stone.
red sauce, 0.25 red onion, 0.25 green pepper, 0.25 red pepper, rosemary



What makes a good data repository?



FINDABLE

Data has rich metadata and unique identifier



ACCESSIBLE

Data can be easily downloaded or used by using standard protocols



INTEROPERABLE

Metadata use an accessible and standard language



REUSABLE

Data is well-described and provides clear usage of licences

Sharing code

- Get in the habit of using Git for managing code
- Can the code be openly shared?
- Does the code contain intellectual property that cannot be openly shared?



Making shared code more FAIR

The screenshot shows a Zenodo record page for the software 'fMRIPrep: a robust preprocessing pipeline for functional MRI'. The page is dated March 24, 2023, and is marked as 'Open Access'. It features a list of authors, a 'Researcher(s)' section with more names, and a 'Preview' section showing a file tree for 'fmriprep-23.0.1.zip'. On the right, there are statistics (6,549 views, 1,507 downloads), an 'Indexed in OpenAIRE' badge, and a 'Publication date' section with DOI, keywords, and related identifiers. A 'Versions' section at the bottom right lists two versions: 23.0.1 (Mar 24, 2023) and 22.1.0 (Dec 12, 2022).

zenodo

Search Upload Communities switt4@uwo.ca

March 24, 2023 Software Open Access

fMRIPrep: a robust preprocessing pipeline for functional MRI

Esteban, Oscar; Markiewicz, Christopher J.; Goncalves, Mathias; Provins, Céline; Kent, James D.; DuPre, Elizabeth; Salo, Taylor; Ciric, Rastko; Pinsard, Basile; Blair, Ross W.; Poldrack, Russell A.; Gorgolewski, Krzysztof J.

Researcher(s)

Provins, Céline; Finc, Karolina; Feingold, Franklin; Tooley, Ursula A.; Benson, Noah C.; de la Vega, Alejandro; Schaefer, Theo A.J.; Urchs, Sebastian; Waller, Lea; Lurie, Daniel J.; Heinsfeld, Anibal S.; Mentch, Jeff; Jacoby, Nir; Frederick, Blaise B.; Erramuzpe, Asier; Jamison, Keith W.; Wexler, Joseph B.; Plunkett, Dillon; Nitsch, Alexander; Sneve, Markus H.; Ma, Feilong; Adebimpe, Azeez; Amlien, Inge K.; Bellec, Pierre; Bhagwat, Nikhil; Cieslak, Matthew; Devenyi, Gabriel A.; Gomez, Daniel E. P.; Groen, Iris I. A.; Halchenko, Yaroslav O.; Isik, Ayse Ilkay; Liem, Franz; Moodie, Craig A.; Naveau, Mikaël; Rivera-Dompenciel, Adriana; Satterthwaite, Theodore D.; Sitek, Kevin R.; Stojčić, Hrvoje; Thompson, William H.; Valabregue, Romain; Velasco, Pablo; Wright, Jesse; Ye, Zhifang; Ghosh, Satrajit S.

fMRIPrep is a robust and easy-to-use pipeline for preprocessing of diverse fMRI data. The transparent workflow dispenses of manual intervention, thereby ensuring the reproducibility of the results.

Preview

- fmriprep-23.0.1.zip
 - nipreps-fmriprep-aa29a1c
 - .circleci
 - artifact_path 48 Bytes
 - config.yml 42.1 kB
 - ds005_bids_fasttrack_outputs.txt 1.8 kB
 - ds005_bids_outputs.txt 3.2 kB
 - ds005_legacy_fasttrack_outputs.txt 2.9 kB
 - ds005_legacy_outputs.txt 4.5 kB
 - ds005_legacy_partial_fasttrack_outputs.txt 4.6 kB
 - ds005_legacy_partial_outputs.txt 7.9 kB
 - ds054_fasttrack_outputs.txt 5.4 kB
 - ds054_outputs.txt 6.8 kB
 - ds210_fasttrack_outputs.txt 2.6 kB
 - ds210_outputs.txt 3.8 kB
 - legacy.yml 87 Bytes
 - .codespellrc 176 Bytes
 - .dockerignore 163 Bytes
 - .nit-blame-ignore-revs 912 Bytes

6,549 views **1,507** downloads
See more details...

Indexed in
OpenAIRE

Publication date: March 24, 2023
DOI: DOI 10.5281/zenodo.7768751
Keyword(s): neuroimaging workflow pipeline preprocessing fMRI BIDS
Related identifiers: Documents <https://fmriprep.org>
Part of 10.1038/s41592-018-0235-4
License (for files): Apache License 2.0

Versions

Version	Date
Version 23.0.1 10.5281/zenodo.7768751	Mar 24, 2023
Version 22.1.0 10.5281/zenodo.7430291	Dec 12, 2022

Things to consider before sharing research data

1. Ethics

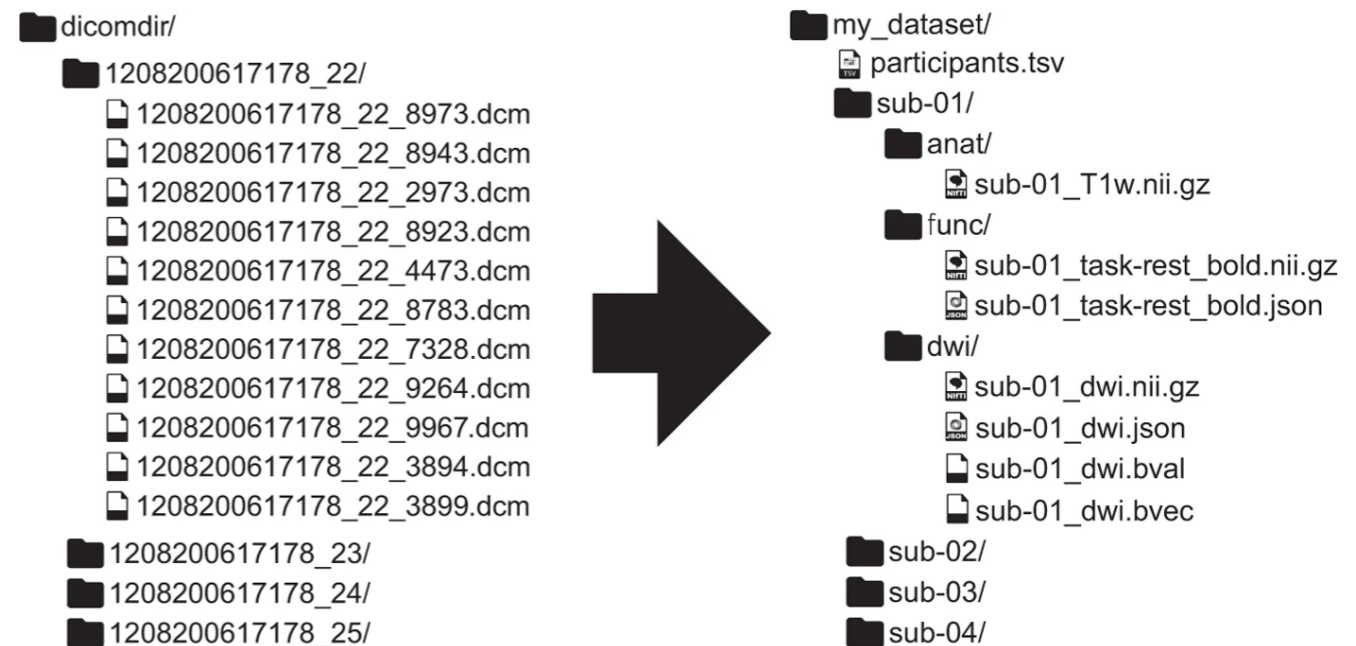
- Does the study have ethical approval to share the data?
- For human research participants, does the consent form explicitly mention sharing the data?
- For human research participants, can the data be anonymized?
- Are there institutional rules about sharing animal data?



Should I?

2. Standards

- Is there an existing standard for the data?
- Specific filetype?
- Specific filename/organization structure?

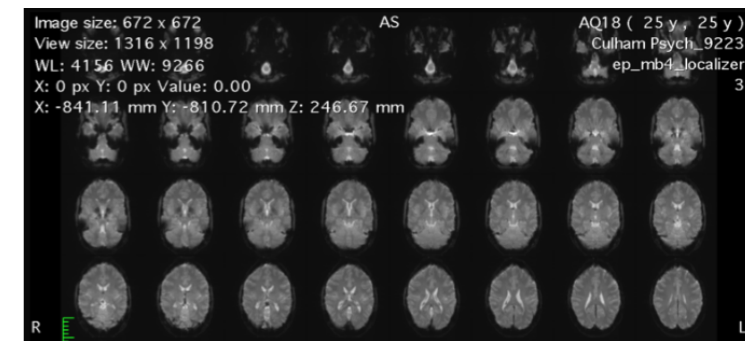


3. Repositories

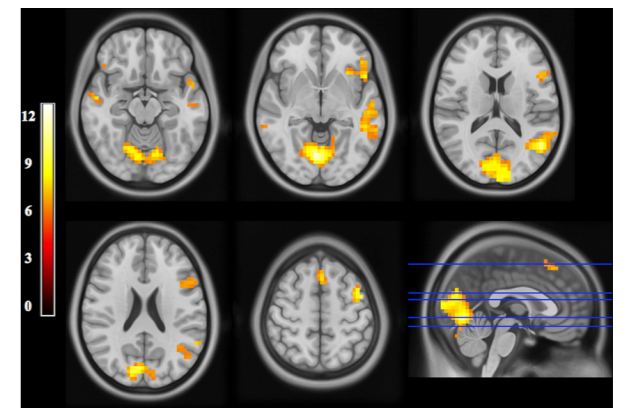
- What type of data is going to be shared?
- Can more than the raw data be shared?
- Does the repository meet the FAIR principles?
- What are the preservation policies of the repository?



OpenNEURO



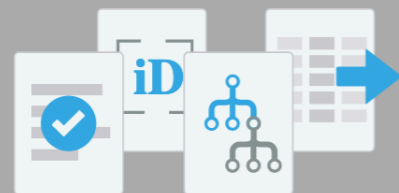
NEUROVAULT



Where can I find more information?

A curated, informative and educational resource on data and metadata standards, inter-related to databases and data policies.

We guide consumers to discover, select and use these resources with confidence, and producers to make their resource more discoverable, more widely adopted and cited.



1596 Standards

Terminology Artifact	830
Model/Format	509
Reporting Guideline	234
Identifier Schema	23

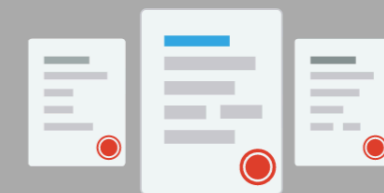
[VIEW ALL](#)



1885 Databases

Repositories	967
Knowledgebases	794
Knowledgebase/Repositories	124

[VIEW ALL](#)

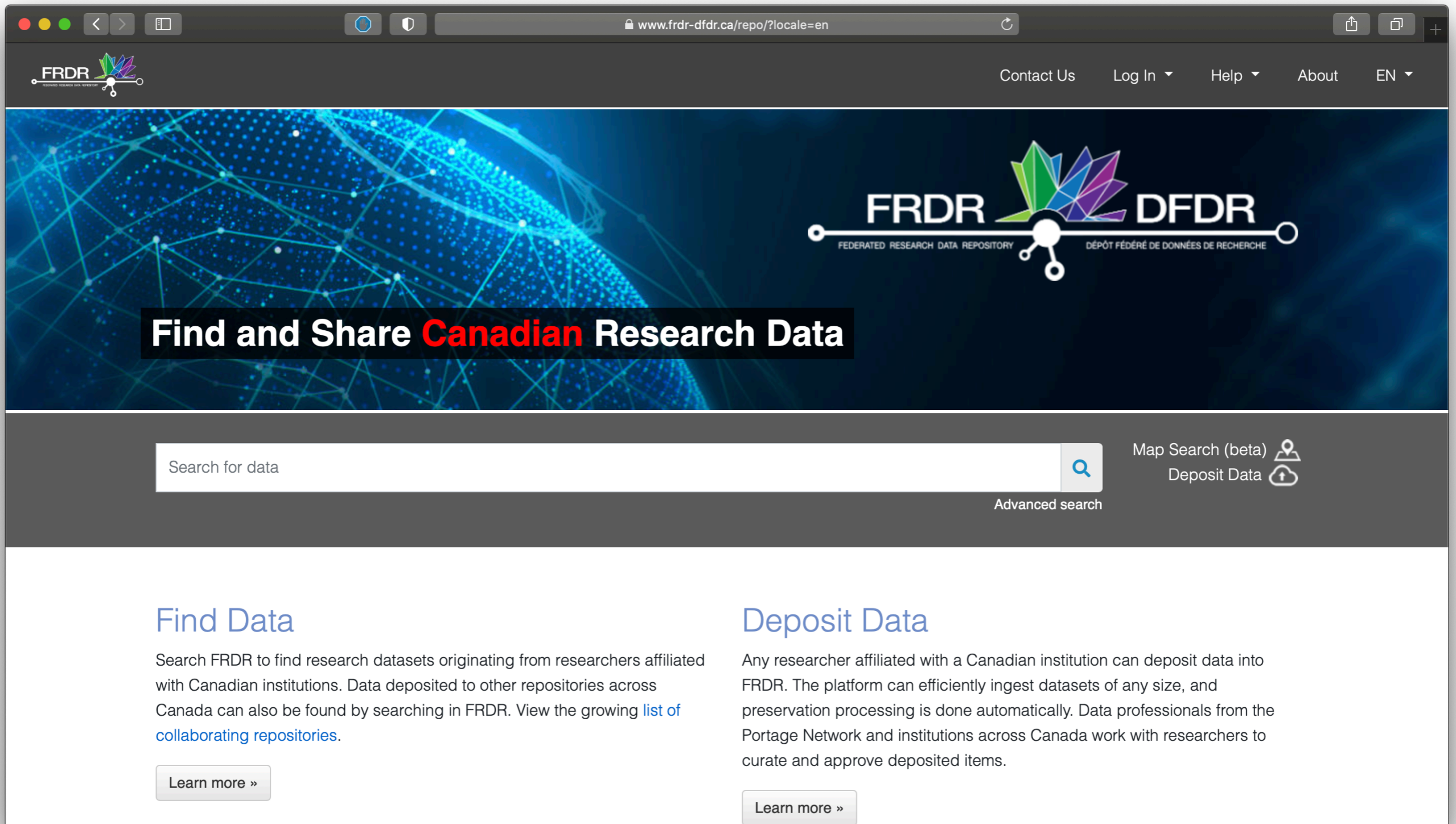


157 Policies

Journal	93
Funder	23
Society	13
Project	13

[VIEW ALL](#)

What if I cannot find an existing repository?



The screenshot shows the homepage of the FRDR/DFDR website. The browser address bar displays www.frdr-dfdr.ca/repo/?locale=en. The page features a navigation menu with links for Contact Us, Log In, Help, About, and EN. A large banner with a blue network background contains the text "Find and Share **Canadian** Research Data". Below the banner is a search bar with the placeholder text "Search for data" and a search icon. To the right of the search bar are links for "Map Search (beta)" and "Deposit Data". The main content area is divided into two columns: "Find Data" and "Deposit Data".

FRDR
FEDERATED RESEARCH DATA REPOSITORY

DFDR
DÉPÔT FÉDÉRÉ DE DONNÉES DE RECHERCHE

Find and Share **Canadian Research Data**

Search for data

Advanced search

Map Search (beta)

Deposit Data

Find Data

Search FRDR to find research datasets originating from researchers affiliated with Canadian institutions. Data deposited to other repositories across Canada can also be found by searching in FRDR. View the growing [list of collaborating repositories](#).

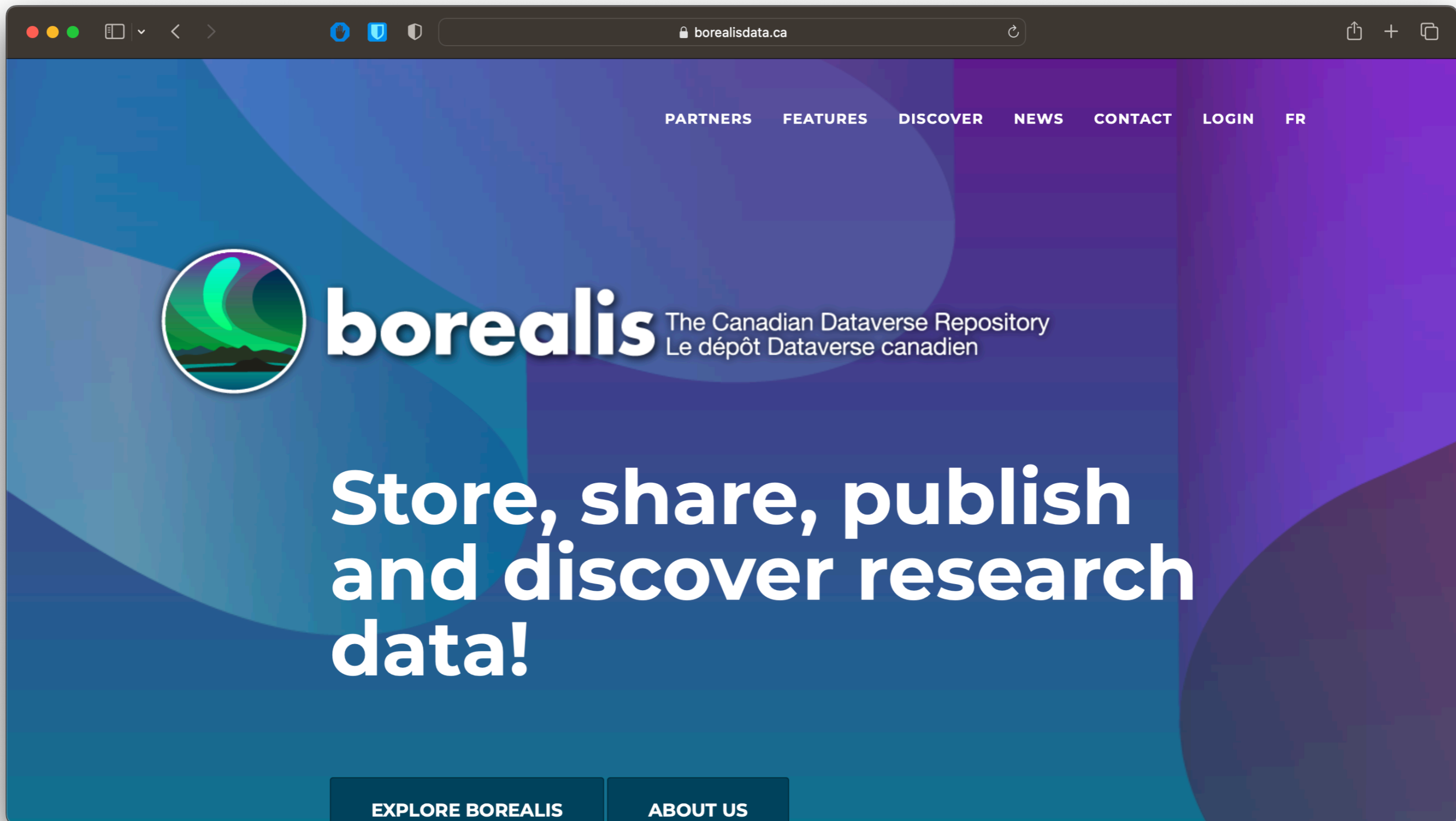
Learn more »

Deposit Data

Any researcher affiliated with a Canadian institution can deposit data into FRDR. The platform can efficiently ingest datasets of any size, and preservation processing is done automatically. Data professionals from the Portage Network and institutions across Canada work with researchers to curate and approve deposited items.


Learn more »

Small data files (e.g., tabular)?



The image shows a browser window displaying the homepage of Borealis, the Canadian Dataverse Repository. The browser's address bar shows the URL borealisdata.ca. The website features a navigation menu with links for PARTNERS, FEATURES, DISCOVER, NEWS, CONTACT, LOGIN, and FR. The main content area includes the Borealis logo, which depicts a circular image of the aurora borealis over a landscape. To the right of the logo, the text reads "borealis" in a large, bold, white font, followed by "The Canadian Dataverse Repository" and "Le dépôt Dataverse canadien" in a smaller font. Below this, a large white headline states "Store, share, publish and discover research data!". At the bottom of the page, there are two dark blue buttons: "EXPLORE BOREALIS" and "ABOUT US".

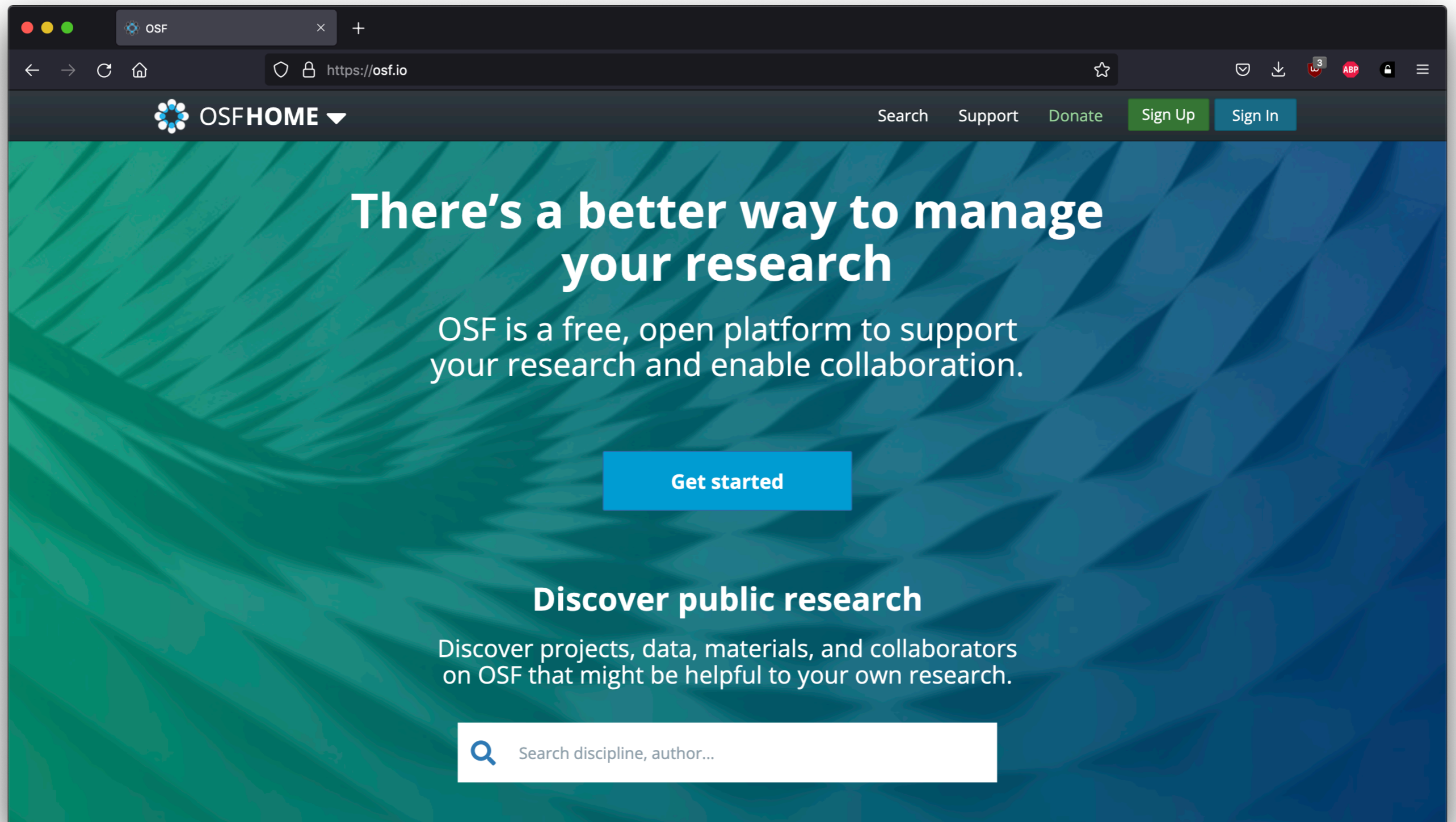
PARTNERS FEATURES DISCOVER NEWS CONTACT LOGIN FR

 **borealis** The Canadian Dataverse Repository
Le dépôt Dataverse canadien

**Store, share, publish
and discover research
data!**

EXPLORE BOREALIS ABOUT US

A more generic option



The image shows a browser window displaying the OSFHOME website. The browser's address bar shows the URL <https://osf.io>. The website header includes the OSFHOME logo, a search bar, and navigation links for Support, Donate, Sign Up, and Sign In. The main content area features a large teal and blue background with the following text:

There's a better way to manage your research

OSF is a free, open platform to support your research and enable collaboration.

[Get started](#)

Discover public research

Discover projects, data, materials, and collaborators on OSF that might be helpful to your own research.

Search discipline, author...

Some final thoughts

- Data sharing takes time and effort
- Rich meta-data and the adoption of data standards makes data more useful
- Consider adopting some of the FAIR principles for local data management