The Dataverse Project
UbuntuNet-Connect,2024

Sonia Barbosa

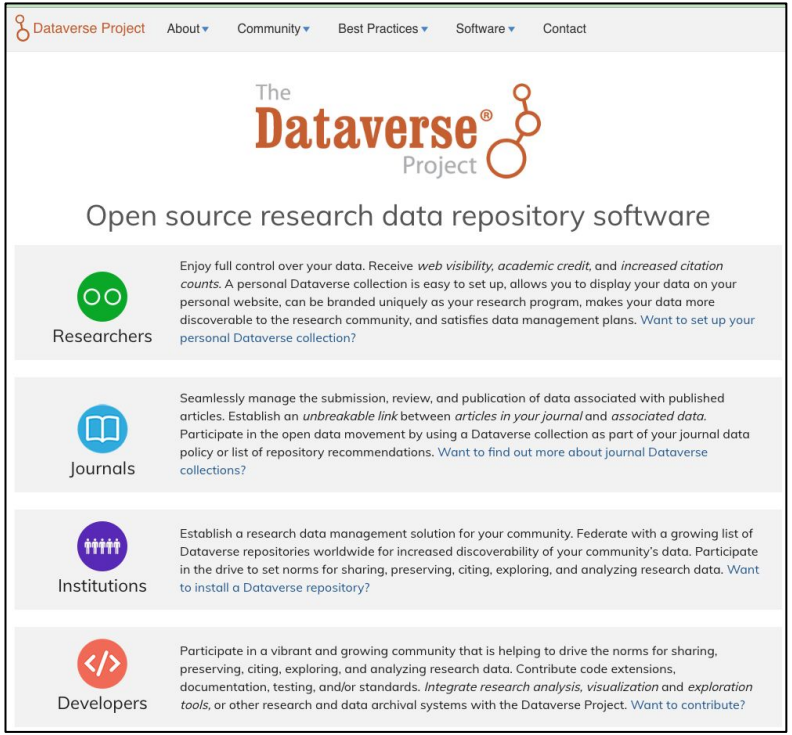
Agenda

1. Dataverse Project History and Timeline(s)
2. Why the Dataverse Project and Use Cases
3. Dataverse Tools and Features
4. Computing on the Data
5. Grants and Collaborations
6. Global Dataverse Community
7. Dataverse Project Today & Tomorrow
8. Collaborate with Dataverse

Dataverse Project

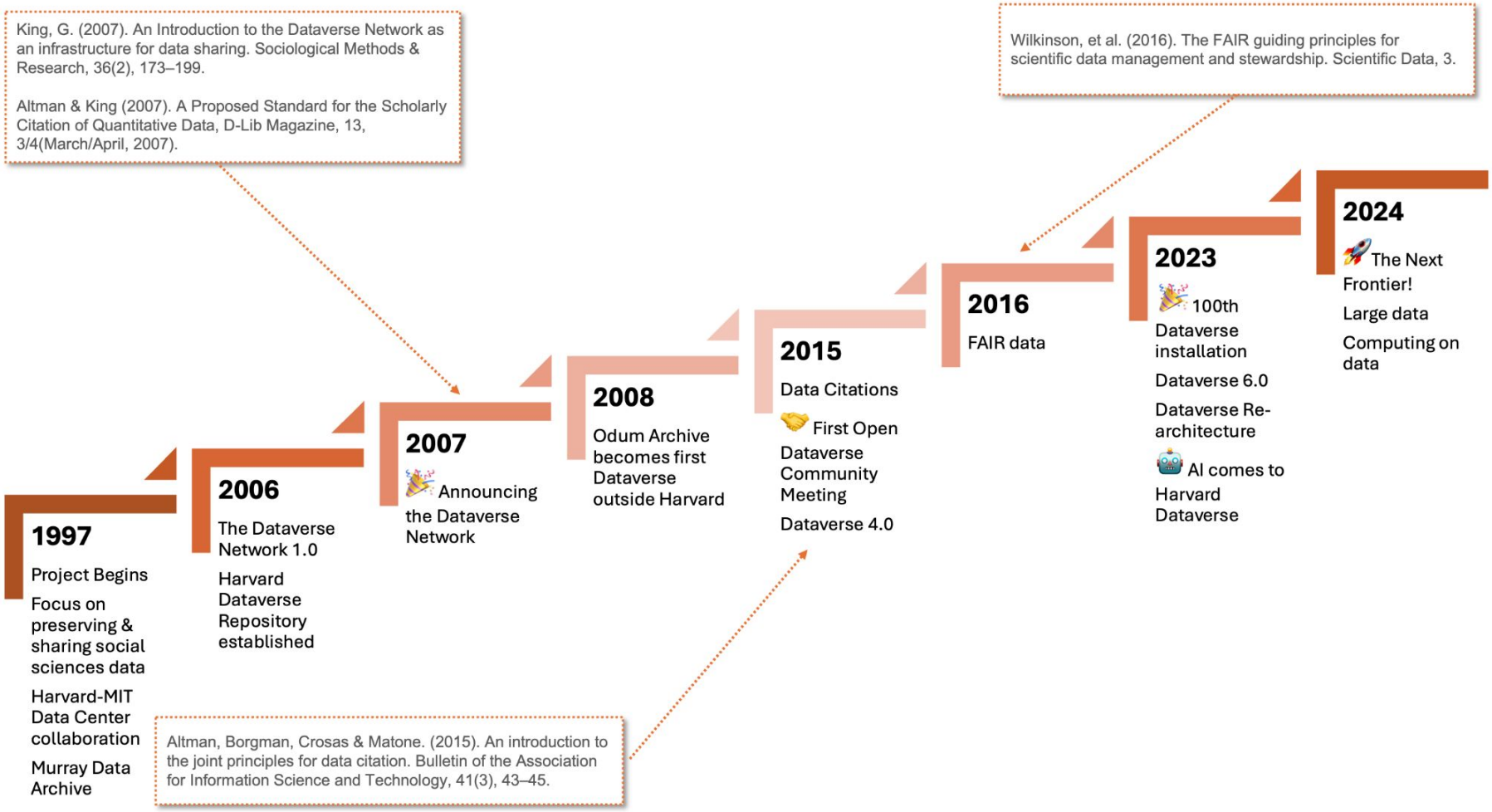
About the Dataverse Project

- An **open-source** repository to publish, cite, and archive **research data**
- Built to support multiple types of **data, users, and workflows**
- Developed at Harvard's Institute for Quantitative Social Science (IQSS)
- Established in 1997, Dataverse Network Launch in 2006
- Development funded by IQSS and with grants, in collaboration with institutions around the world
- 2022 - present: Re-Architecture
- Core team
    - @ IQSS - developers, UX/UI, metadata specialists, curation team, leadership team
    - Key contributors from the community with full privileges as IQSS team



Dataverse Project Goals

- Grow the Dataverse **community**
- Empower the open source community to explore and implement new **Dataverse applications, tools, and services**
- Develop the capability to handle **sensitive data** and **big data**
- Expand **data** and **metadata** features for existing and new disciplines
- Expand **archival and preservation** features
- Increase **interoperability** through the implementation of **standards**
- Increase contributions from the **open source development community**
- Improve the **Dataverse user experience**


King, G. (2007). An Introduction to the Dataverse Network as an infrastructure for data sharing. Sociological Methods & Research, 36(2), 173–199.
Altman & King (2007). A Proposed Standard for the Scholarly Citation of Quantitative Data, D-Lib Magazine, 13, 3/4(March/April, 2007).
Wilkinson, et al. (2016). The FAIR guiding principles for scientific data management and stewardship. Scientific Data, 3.
1997
Project Begins
Focus on preserving & sharing social sciences data
Harvard-MIT Data Center collaboration
Murray Data Archive
2006
The Dataverse Network 1.0
Harvard Dataverse Repository established
2007
Announcing the Dataverse Network
2008
Odum Archive becomes first Dataverse outside Harvard
2015
Data Citations
First Open Dataverse Community Meeting
Dataverse 4.0
2016
FAIR data
2023
100th Dataverse installation
Dataverse 6.0
Dataverse Re-architecture
AI comes to Harvard Dataverse
2024
The Next Frontier!
Large data
Computing on data
Altman, Borgman, Crosas & Matone. (2015). An introduction to the joint principles for data citation. Bulletin of the Association for Information Science and Technology, 41(3), 43–45.

What Challenges does The Dataverse Project Solve?

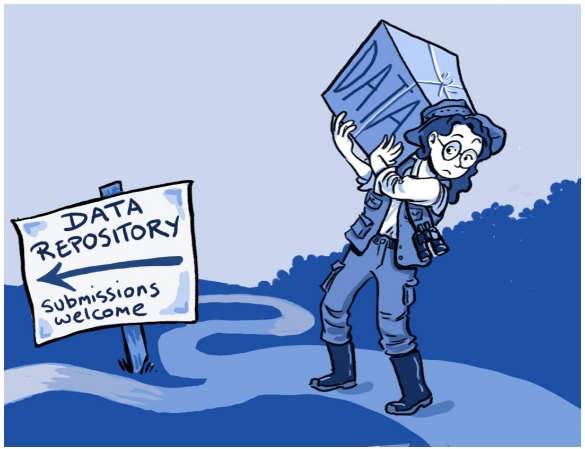
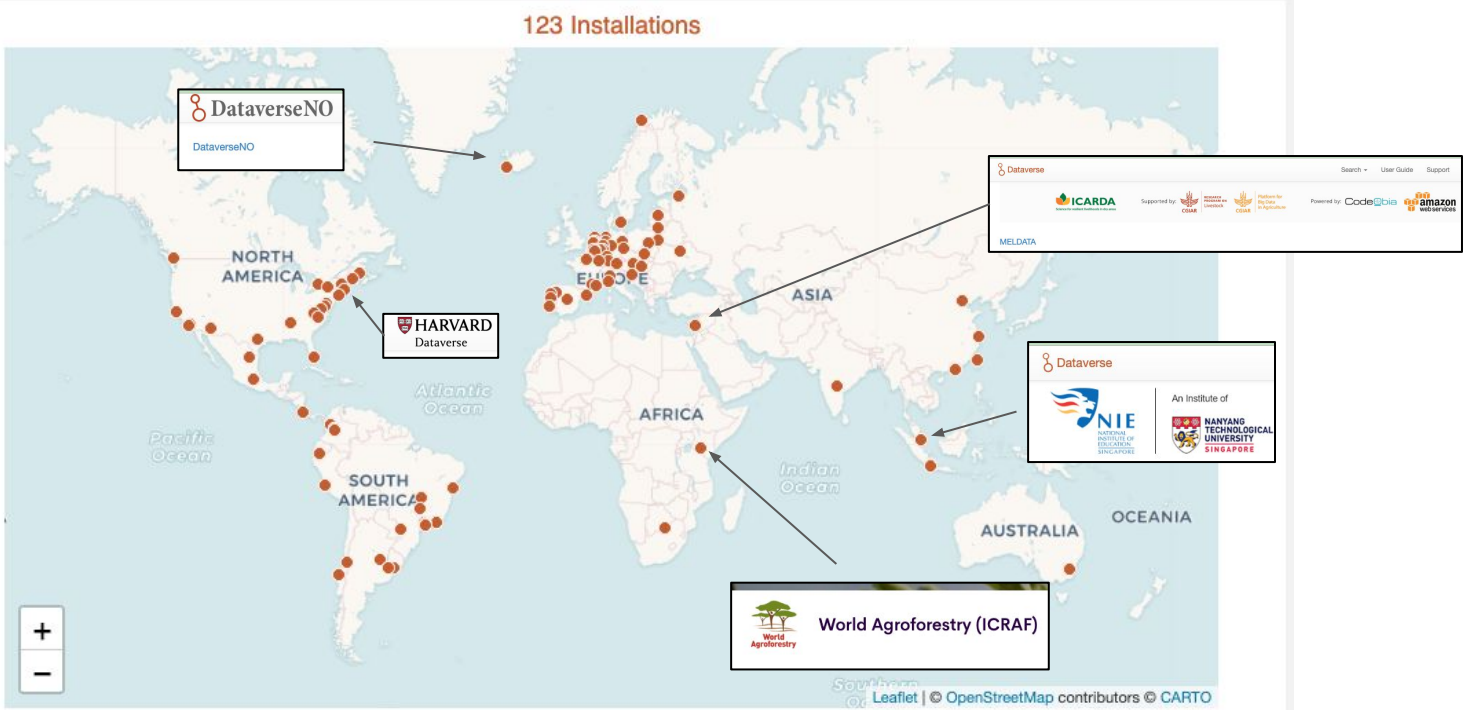


Illustration credit: Ainsley Seago.
doi:10.1371/journal.pbio.1001779.g001

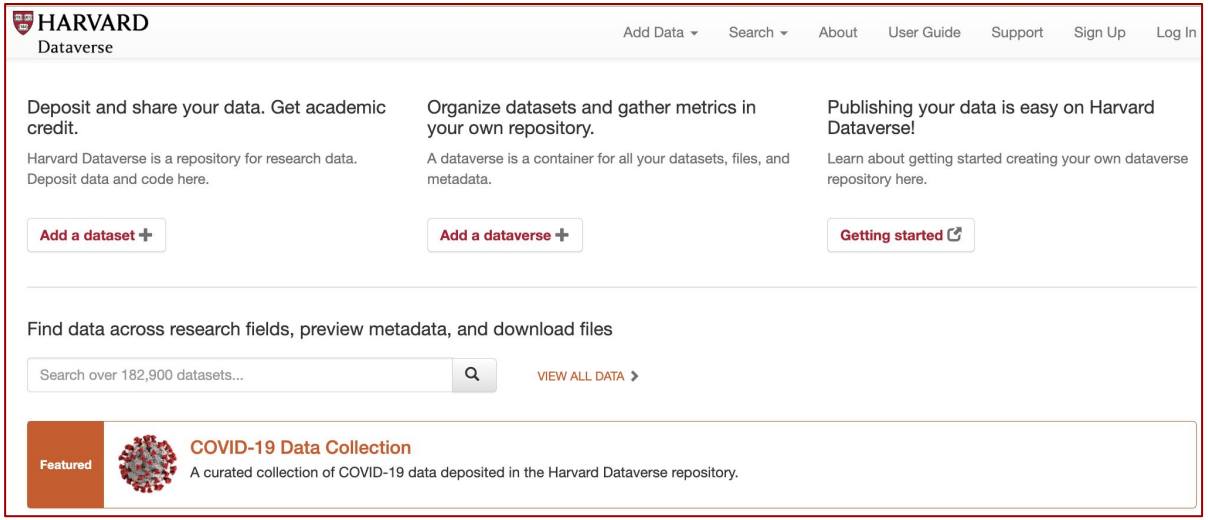
- Dataverse helps researchers manage the full lifecycle of data—from creation and analysis to publication and preservation—while meeting standards for openness and reproducibility

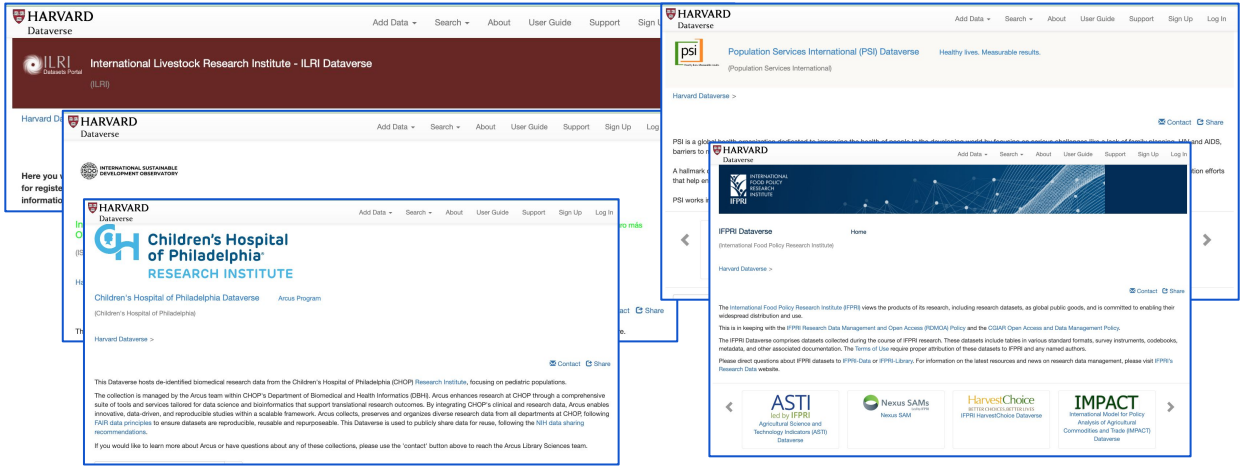
Challenges	*Solutions*
Data inaccessibility	**Centralized repository**
Lack of data credit	**Data Sharing**
Data Preservation concerns	**Data citation system**
Complex data management	**Credit for Data**
	Data Preservation
	Data Discoverability
	Versioning
	Data Security

DATAVERSE REPOSITORIES - A WORLD VIEW



Use Cases





- Dataverses (6,831)
- Datasets (182,901)
- Files (3,409,257)

Dataverse Category

- Research Project (2,556)
- Researcher (2,137)
- Organization or Institution (540)
- Research Group (478)
- Journal (147)
- Laboratory (126)
- Department (78)
- Teaching Course (45)

Subject

- Social Sciences (63,535)
- Arts and Humanities (36,538)
- Medicine, Health and Life Sciences (9,917)
- Earth and Environmental Sciences (9,102)
- Law (5,747)
- Agricultural Sciences (4,540)
- Computer and Information Science (3,901)
- Other (2,675)
- Business and Management (2,444)
- Engineering (2,105)
- Physics (1,674)
- Astronomy and Astrophysics (1,151)
- Chemistry (911)
- Mathematical Sciences (620)

Publication Year

- 2024 (476)
- 2023 (271)
- 2022 (829)
- 2021 (1,047)
- 2020 (842)
- 2019 (492)
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- 2017 (509)
- 2016 (521)
- 2015 (490)
- 2014 (234)
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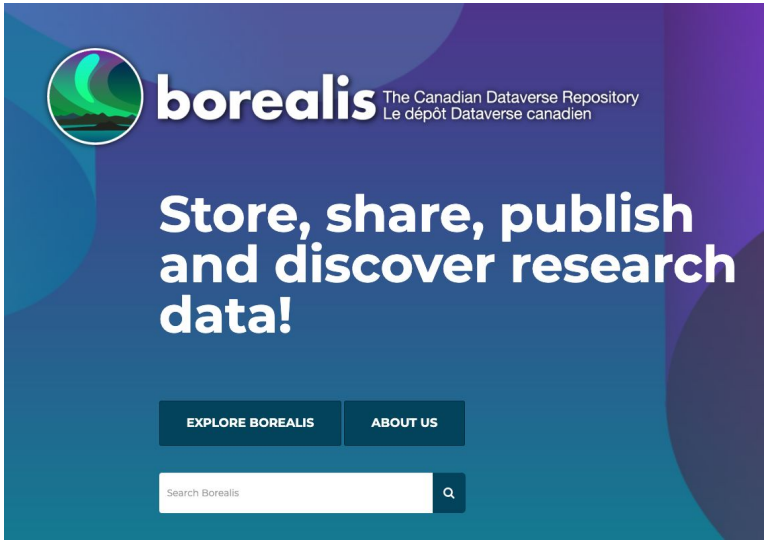
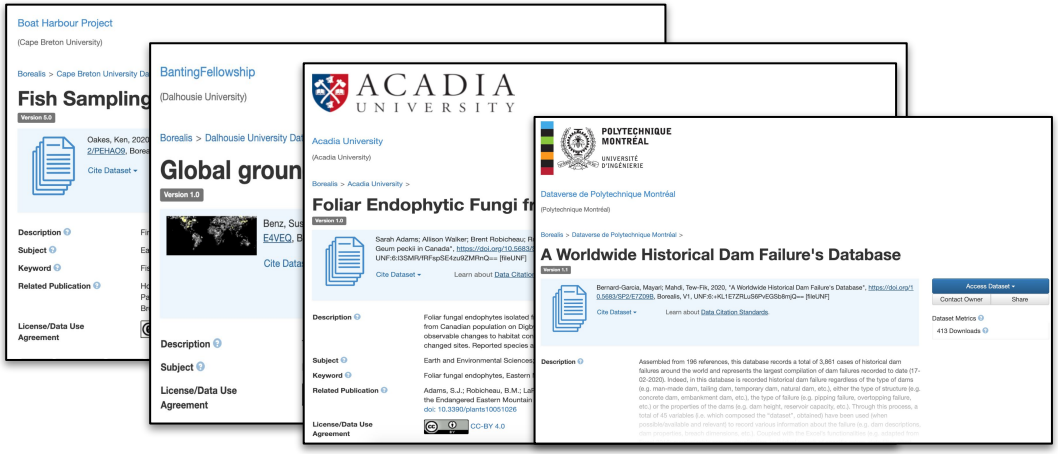
- 2010 (55)
- 2009 (42)
- 2008 (49)
- 2007 (114)

Covid19 data sharing!





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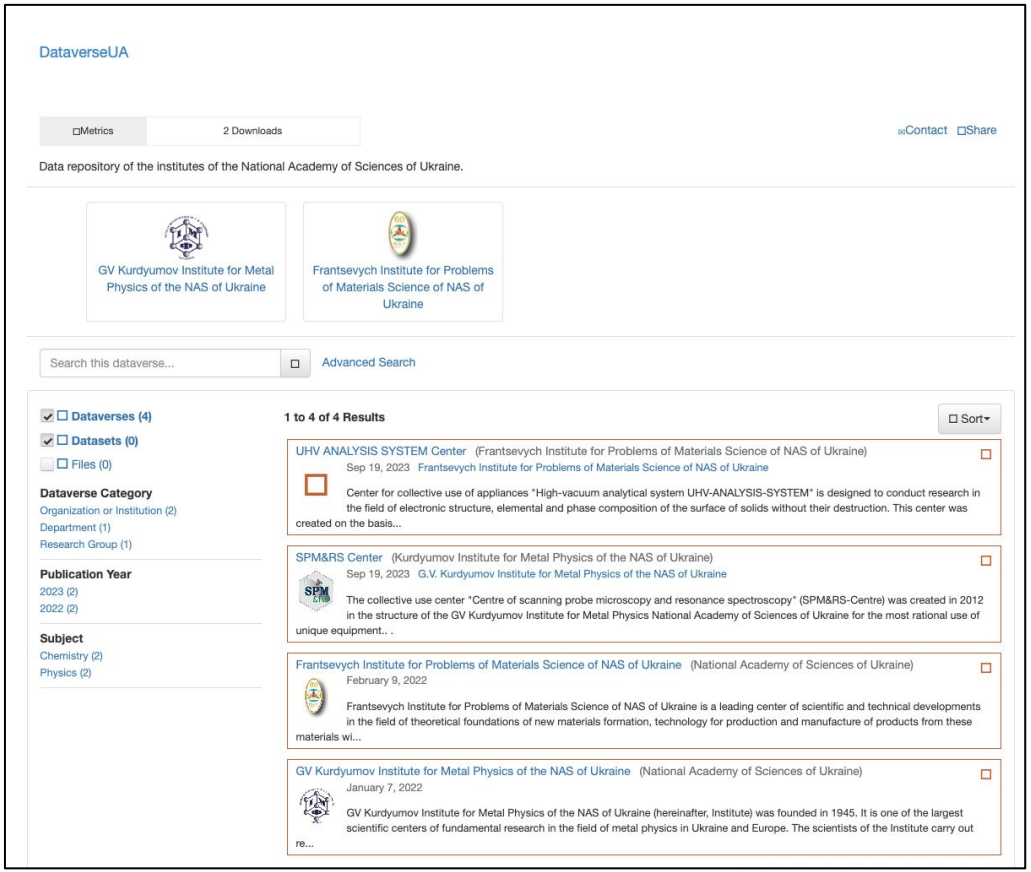

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Author
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Bar-Cohen, Y. (261)
Chien, Steve (186)
Eldering, Annmarie (142)
Bar-Cohen, Yoseph (141)
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Report (413)
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Deep Space Optical Communications Technology Demonstration
Oct 20, 2024
Abhijit Biswas, 2024, "Deep Space Optical Communications Technology Demonstration", https://doi.org/10.48577/jpl.BTYYVY, Optica Laser Congress 2024, JPL Open Repository
Space-to-ground high data-rate (6.25 to 267 Mb/s) deep space optical communications over distances of 0.2 to 2.5 astronomical units (AU) were demonstrated with a space payload hosted by the Psyche Mission spacecraft, (launched, October 13, 2023) and ground assets. The system impl...

Revealing the Lifecycle of Interstellar Dust with Polarimetry
Oct 18, 2024
Brandon Hensley, 2024, "Revealing the Lifecycle of Interstellar Dust with Polarimetry", https://doi.org/10.48577/jpl.C7C5GL, Observatoire astronomique de Strasbourg Colloquium, JPL Open Repository
No abstract available.

Autonomous robotics and AI are driving NASA's progress in planetary exploration
Oct 18, 2024
Vandi Verma, 2024, "Autonomous robotics and AI are driving NASA's progress in planetary exploration", https://doi.org/10.48577/jpl.M4P8IA, 2024 United Nations AI for Good Summit, JPL Open Repository
No abstract available.

Cross-Disciplinary Characterization of Exoplanet Atmospheres: Observation, Theory, and Experiment

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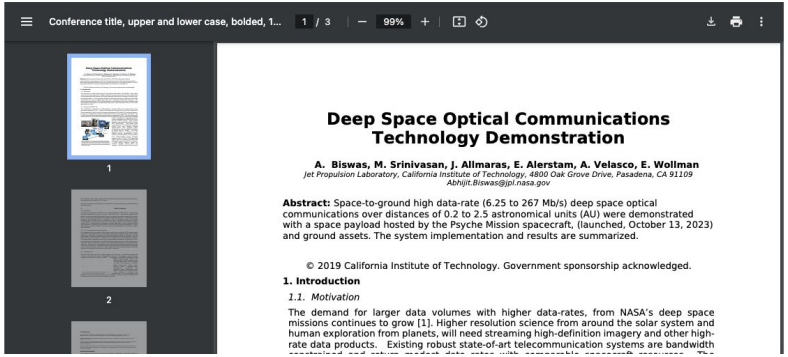

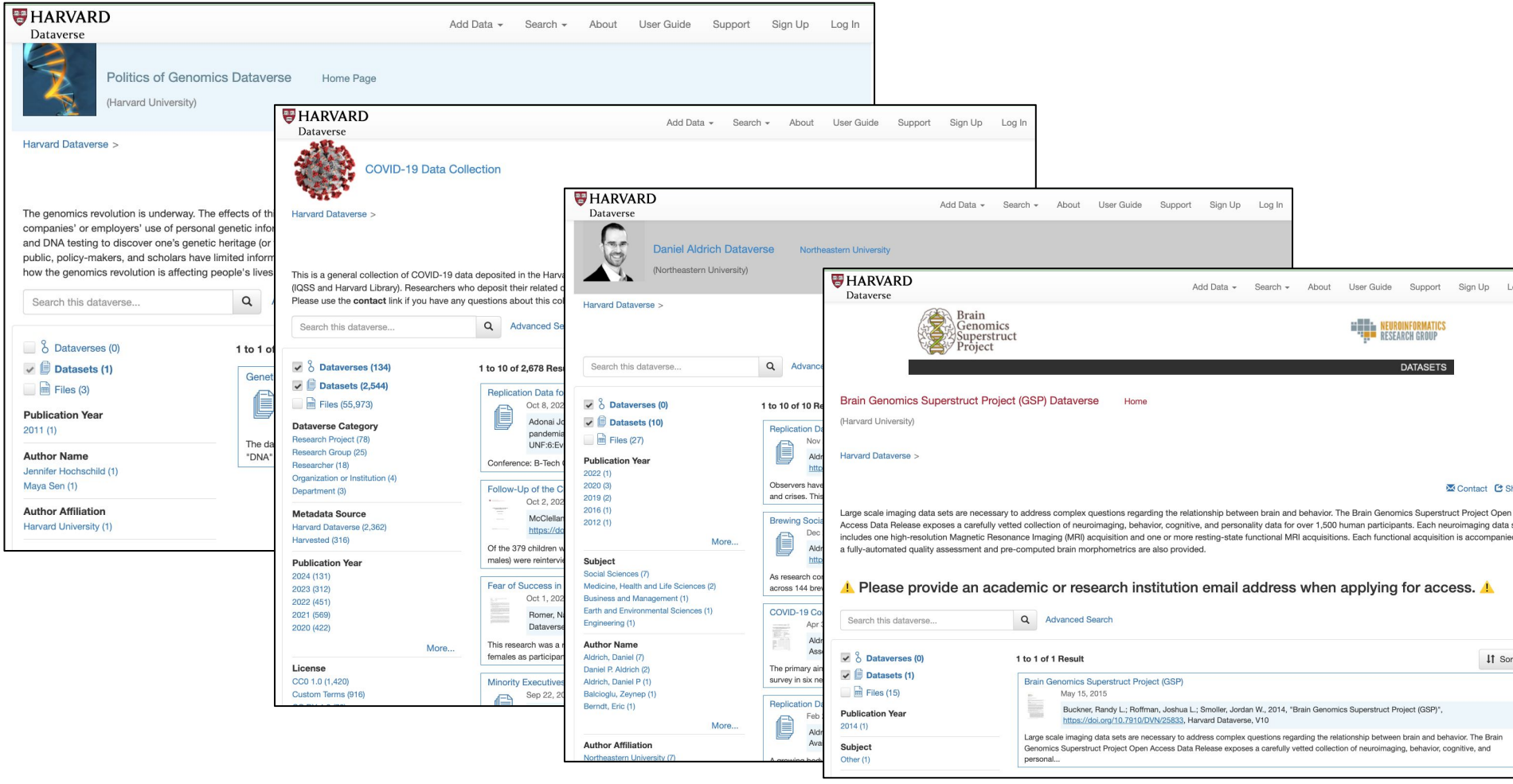
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Publication Year
2011 (1)
Author Name
Jennifer Hochschild (1)
Maya Sen (1)
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Harvard University (1)
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Medicine, Health and Life Sciences (2)
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Engineering (1)
Author Name
Aldrich, Daniel (7)
Daniel P. Aldrich (2)
Aldrich, Daniel P (1)
Balcioglu, Zeynep (1)
Berndt, Eric (1)
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Author Affiliation
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Brain Genomics Superstruct Project
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Contact
Large scale imaging data sets are necessary to address complex questions regarding the relationship between brain and behavior. The Brain Genomics Superstruct Project Open Access Data Release exposes a carefully vetted collection of neuroimaging, behavior, cognitive, and personality data for over 1,500 human participants. Each neuroimaging data s
includes one high-resolution Magnetic Resonance Imaging (MRI) acquisition and one or more resting-state functional MRI acquisitions. Each functional acquisition is accompanie
a fully-automated quality assessment and pre-computed brain morphometrics are also provided.
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May 15, 2015
Buckner, Randy L.; Roffman, Joshua L.; Smoller, Jordan W., 2014, "Brain Genomics Superstruct Project (GSP)",
https://doi.org/10.7910/DVN/25833, Harvard Dataverse, V10
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2013 Photographs

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Master, Daniel M.; Stager, Lawrence E., 2022, "A13_26171.jpg", https://doi.org/10.7910/DVN/EBT0RW, Harvard Dataverse, V1

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Subject	Arts and Humanities
Keyword	Archaeology
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1 File

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Photo

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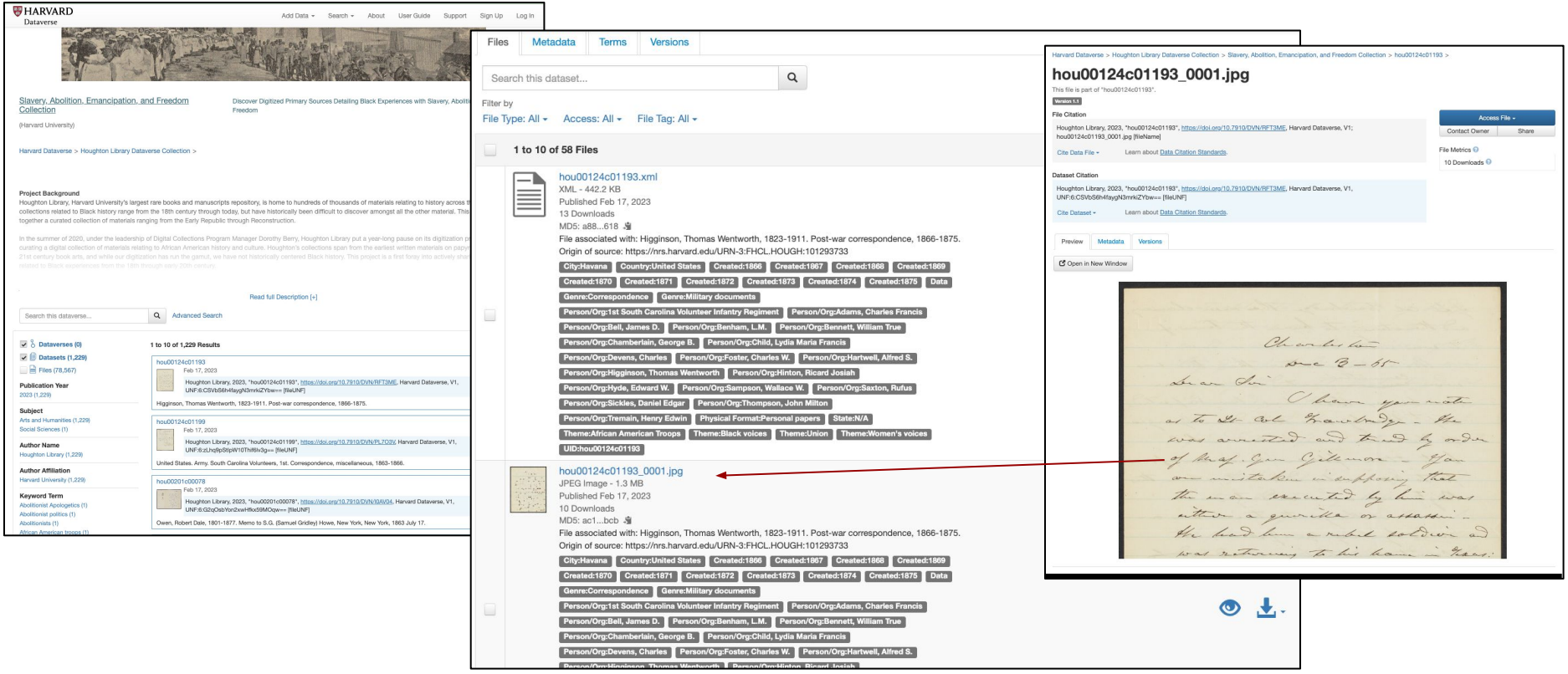
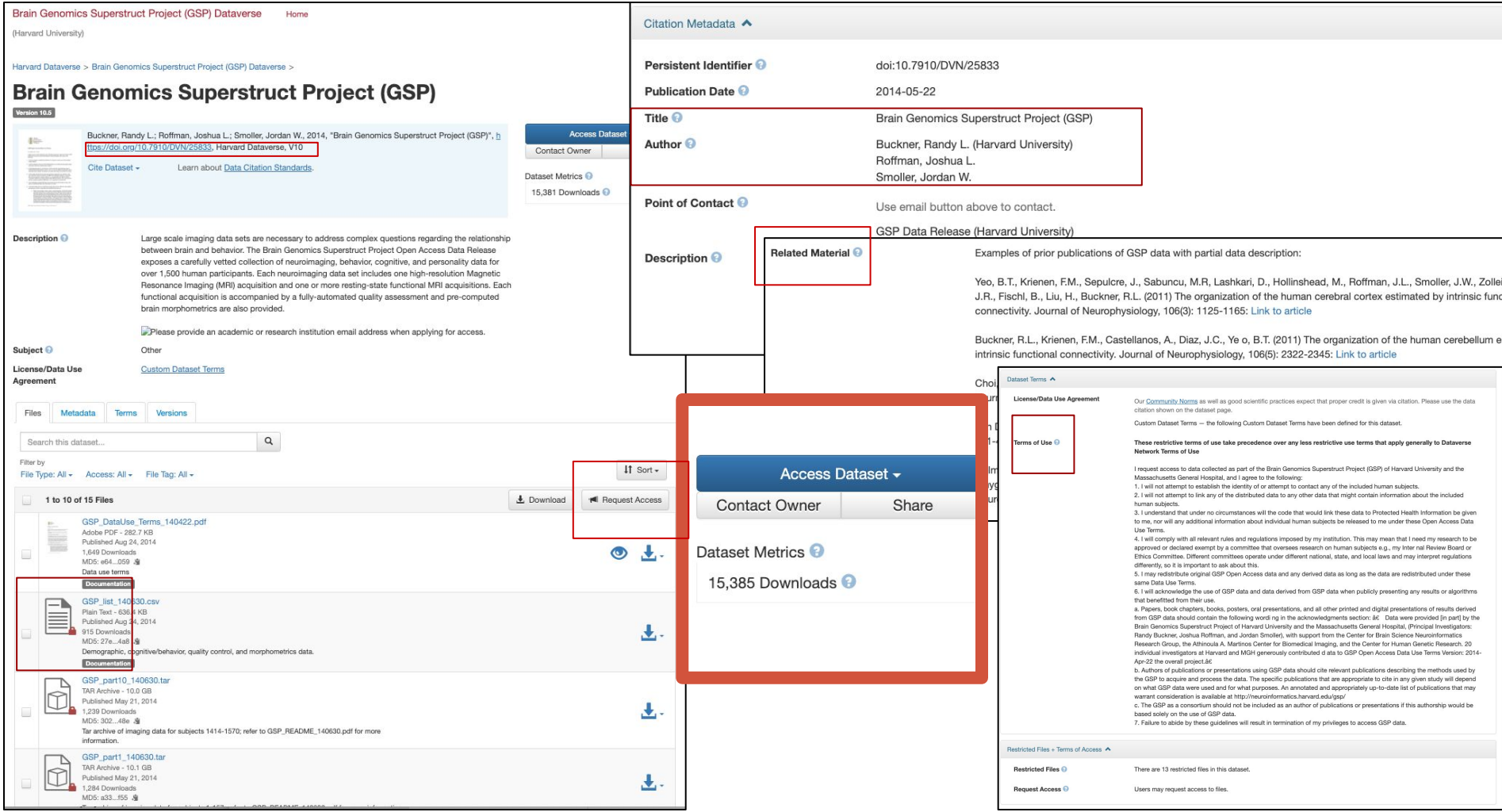
Tools/interoperability



https://github.com/GlobalDataverseCommunityConsortium/dataverse-uploader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Persistent Identifier
doi:10.7910/DVN/25833
Publication Date
2014-05-22
Title
Brain Genomics Superstruct Project (GSP)
Author
Buckner, Randy L. (Harvard University)
Roffman, Joshua L.
Smoller, Jordan W.
Point of Contact
Use email button above to contact.
Description
GSP Data Release (Harvard University)
Related Material
Examples of prior publications of GSP data with partial data description:
Yeo, B.T., Krienen, F.M., Sepulcre, J., Sabuncu, M.R, Lashkari, D., Hollinshead, M., Roffman, J.L., Smoller, J.W., Zollei
J.R., Fischl, B., Liu, H., Buckner, R.L. (2011) The organization of the human cerebral cortex estimated by intrinsic func
connectivity. Journal of Neurophysiology, 106(3): 1125-1165: Link to article
Buckner, R.L., Krienen, F.M., Castellanos, A., Diaz, J.C., Ye o, B.T. (2011) The organization of the human cerebellum e
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I request access to data collected as part of the Brain Genomics Superstruct Project (GSP) of Harvard University and the Massachusetts General Hospital, and I agree to the following:
1. I will not attempt to establish the identity of or attempt to contact any of the included human subjects.
2. I will not attempt to link any of the distributed data to any other data that might contain information about the included human subjects.
3. I understand that under no circumstances will the code that would link these data to Protected Health Information be given to me, nor will any additional information about individual human subjects be released to me under these Open Access Data Use Terms.
4. I will comply with all relevant rules and regulations imposed by my institution. This may mean that I need my research to be approved or declared exempt by a committee that oversees research on human subjects e.g., my Inter nal Review Board or Ethics Committee. Different committees operate under different national, state, and local laws and may interpret regulations differently, so it is important to ask about this.
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a. Papers, book chapters, books, posters, oral presentations, and all other printed and digital presentations of results derived from GSP data should contain the following word ng in the acknowledgments section: â€ Data were provided [in part] by the Brain Genomics Superstruct Project of Harvard University and the Massachusetts General Hospital, (Principal Investigators: Randy Buckner, Joshua Roffman, and Jordan Smoller), with support from the Center for Brain Science Neuroinformatics Research Group, the Athinoula A. Martinos Center for Biomedical Imaging, and the Center for Human Genetic Research. 20 individual investigators at Harvard and MGH generously contributed d ata to GSP Open Access Data Use Terms Version: 2014-Apr-22 the overall project.â€
b. Authors of publications or presentations using GSP data should cite relevant publications describing the methods used by the GSP to acquire and process the data. The specific publications that are appropriate to cite in any given study will depend on what GSP data were used and for what purposes. An annotated and appropriately up-to-date list of publications that may warrant consideration is available at http://neuroinformatics.harvard.edu/gsp/
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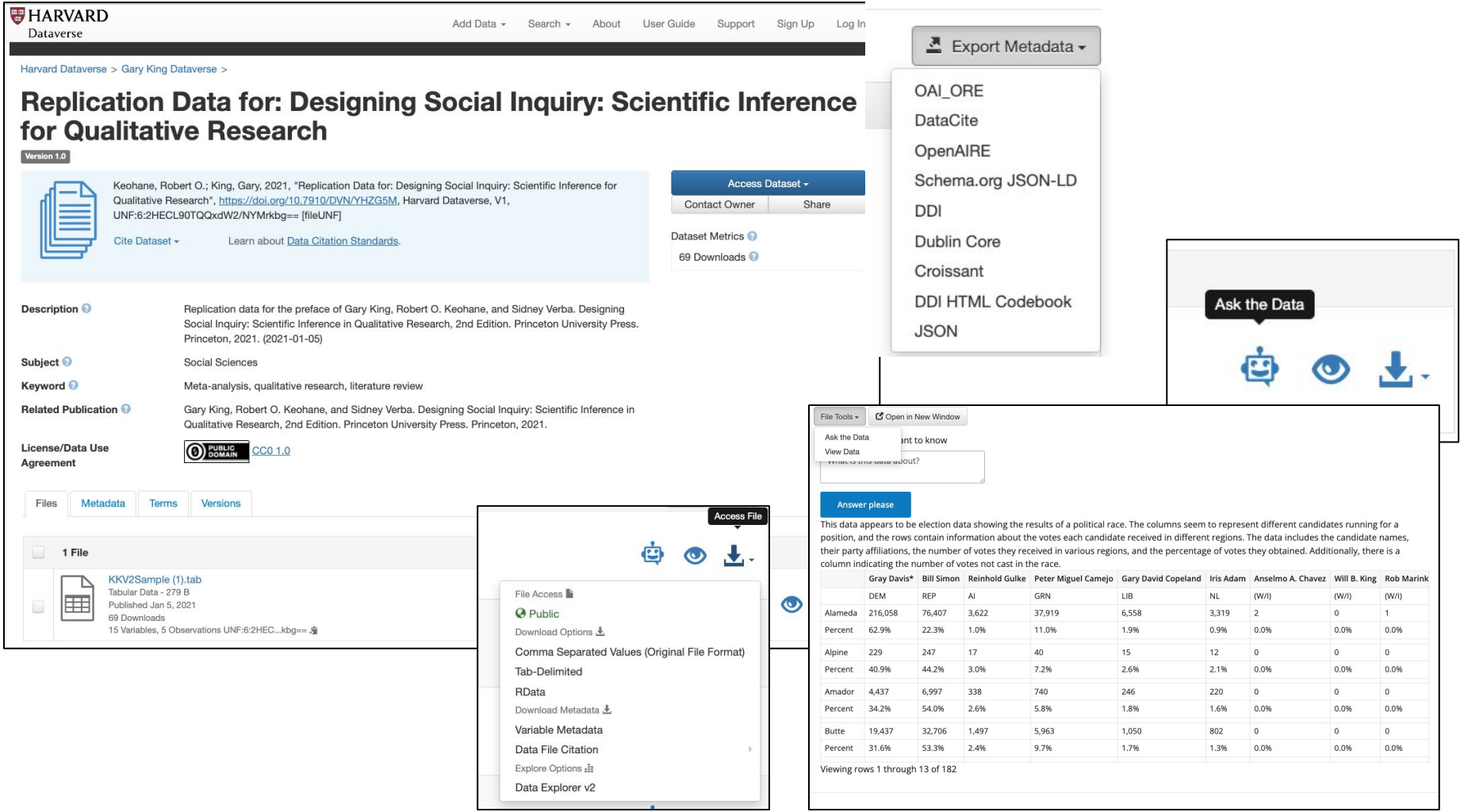
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Replication data for the preface of Gary King, Robert O. Keohane, and Sidney Verba. Designing Social Inquiry: Scientific Inference in Qualitative Research, 2nd Edition. Princeton University Press. Princeton, 2021. (2021-01-05)
Subject
Social Sciences
Keyword
Meta-analysis, qualitative research, literature review
Related Publication
Gary King, Robert O. Keohane, and Sidney Verba. Designing Social Inquiry: Scientific Inference in Qualitative Research, 2nd Edition. Princeton University Press. Princeton, 2021.
License/Data Use Agreement
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Files
Metadata
Terms
Versions
1 File
KKV2Sample (1).tab
Tabular Data - 279 B
Published Jan 5, 2021
69 Downloads
15 Variables, 5 Observations UNF:6:2HEC...kbg==
Export Metadata
OAI_ORE
DataCite
OpenAIRE
Schema.org JSON-LD
DDI
Dublin Core
Croissant
DDI HTML Codebook
JSON
Ask the Data
Access File
File Access
Public
Download Options
Comma Separated Values (Original File Format)
Tab-Delimited
RData
Download Metadata
Variable Metadata
Data File Citation
Explore Options
Data Explorer v2
File Tools
Open in New Window
Ask the Data
View Data
Answer please
This data appears to be election data showing the results of a political race. The columns seem to represent different candidates running for a position, and the rows contain information about the votes each candidate received in different regions. The data includes the candidate names, their party affiliations, the number of votes they received in various regions, and the percentage of votes they obtained. Additionally, there is a column indicating the number of votes not cast in the race.
Gray Davis* Bill Simon Reinhold Gulke Peter Miguel Camejo Gary David Copeland Iris Adam Anselmo A. Chavez Will B. King Rob Marink
DEM REP AI GRN LIB NL (W/I) (W/I) (W/I)
Alameda 216,058 76,407 3,622 37,919 6,558 3,319 2 0 1
Percent 62.9% 22.3% 1.0% 11.0% 1.9% 0.9% 0.0% 0.0% 0.0%
Alpine 229 247 17 40 15 12 0 0 0
Percent 40.9% 44.2% 3.0% 7.2% 2.6% 2.1% 0.0% 0.0% 0.0%
Amador 4,437 6,997 338 740 246 220 0 0 0
Percent 34.2% 54.0% 2.6% 5.8% 1.8% 1.6% 0.0% 0.0% 0.0%
Butte 19,437 32,706 1,497 5,963 1,050 802 0 0 0
Percent 31.6% 53.3% 2.4% 9.7% 1.7% 1.3% 0.0% 0.0% 0.0%
Viewing rows 1 through 13 of 182

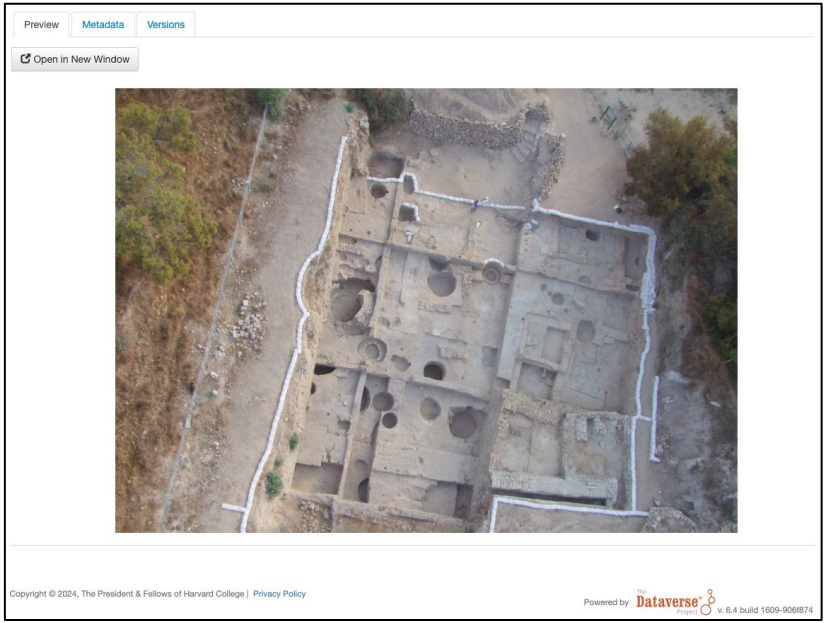
Dataverse Tools and Features

Dataverse Community Integrations & Tools

- **Tools that talk to Dataverse**
  - generally used to deposit data into Dataverse (via Deposit API)
  - usually don't require anything special to be set up in the Dataverse repository
- **Tools that Dataverse talks to**
  - user starts on Dataverse and is directed to the external tool
    - require manifest files
  - have predefined areas in the UI where these would plug into (**Explore** tools)
  - **OR**, are embedded into the Dataverse UI directly (**Preview** tools and **Query** Tools)
- **Tools that do both**
  - user starts on Dataverse and is directed to the external tool
    - require manifest files
  - also have predefined areas in the UI where these would plug into (**Configure** tools)
  - will also send something back to Dataverse, so need an API token that has "write" privileges

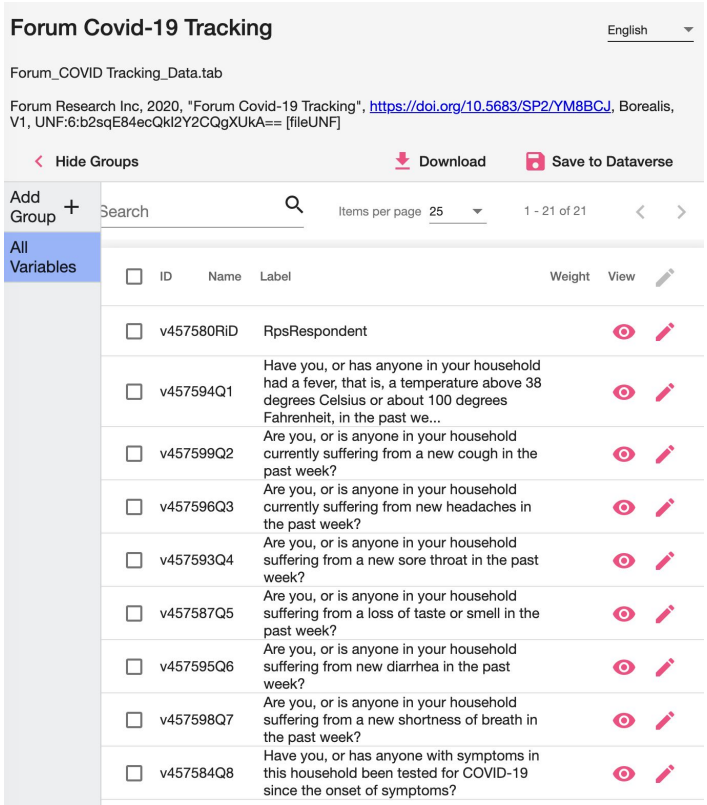
File Previewers

- A set of tools that display the content of files, allowing them to be viewed without downloading the file, including
- audio
- html
- Hypothes.is annotations
- images
- PDF
- text
- video
- tabular data
- spreadsheets
- GeoJSON
- Zip files
- NcML files
- Previewers are available through the preview (eye) icon on Dataset pages
- And also embedded as a tab on Datafile pages



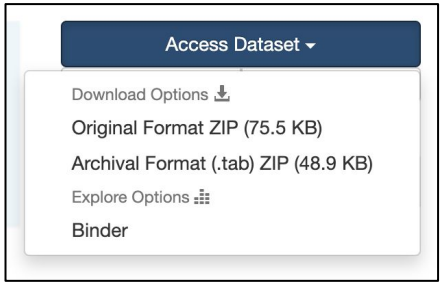
File Exploration, Configuration, and Query Tools

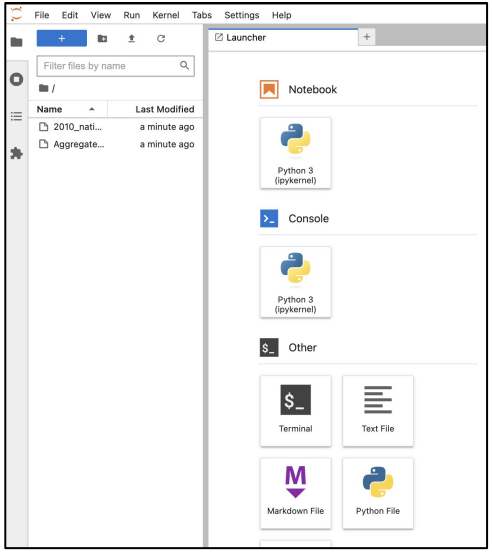
- File level **explore** tools provide a variety of features from data visualization to statistical analysis
- File level **query** tools allow the user to ask questions (e.g. natural language queries) of a data table's contents without having to download the file
- File level **configure** tools allow (authorized) users to send metadata about the file back to Dataverse



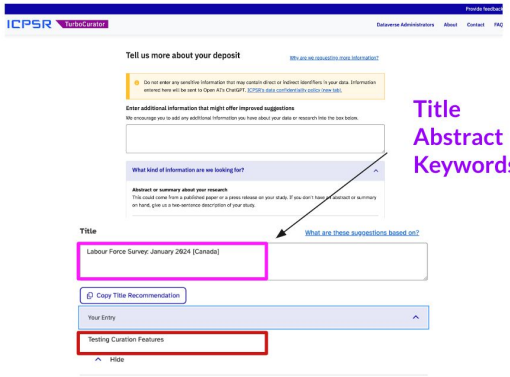
Dataset External Tools

- Dataset level **explore** tools allow the user to explore all the files in a dataset - common use case is reproducibility
  - **WholeTale** - creates reproducible research packages based on popular tools such as Jupyter and RStudio
  - **Binder** - spins up custom computing environments in the cloud (including Jupyter notebooks)
- Dataset level **configure** tools allow (authorized) users to send metadata about the dataset back to Dataverse
  - **Turbo Curator** - uses Open AI's ChatGPT & ICPSR best practices to provides recommendation to enhance metadata & generate meaningful titles, descriptions, and keywords





TurboCurator (ICPSR)



Title
Abstract
Keywords

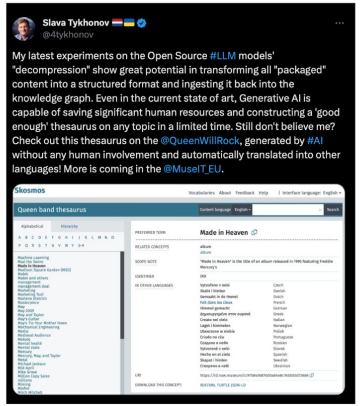
AI & Dataverse

From across the community…

TurboCurator

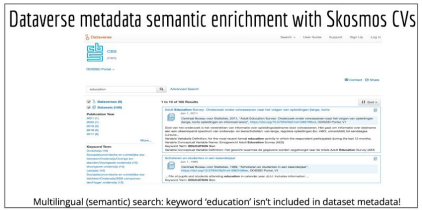
- Reads Dataset metadata fields entered by users in Dataverse
  - Suggestions for Title, Abstract (Description), Keywords
  - Uses ICPSR metadata best practices
  - Metadata curation tasks:
    - Metadata creation, submit for review workflows, improve metadata collections
    - Other kinds of metadata work potentially, possibilities for file level analysis, etc.

From across the community… Slava Tykhonov (DANS-KNAW)



Knowledge Graph Extraction via LLM

Applications to Dataverse include: automatic metadata semantic enrichment, keyword translation, etc.

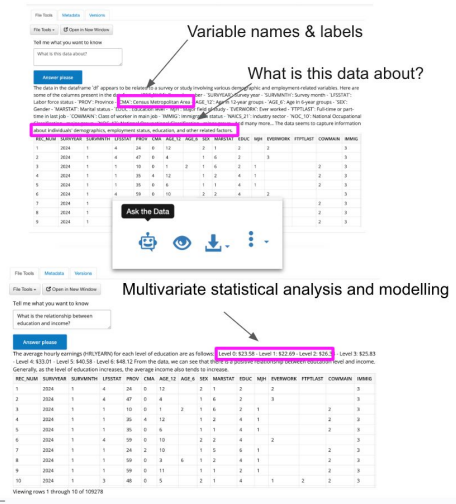


AI & Dataverse

From across the community…

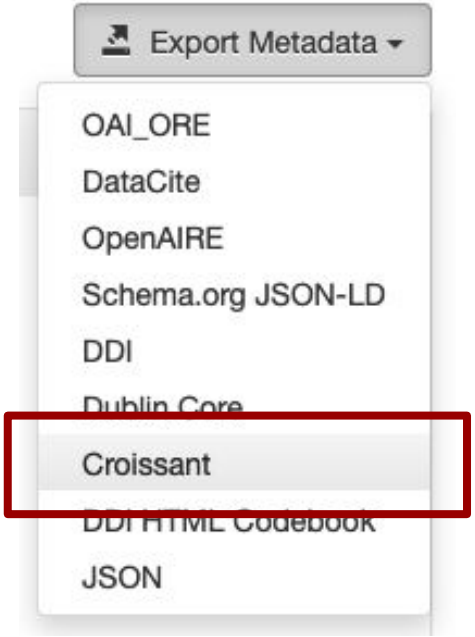
"Ask the Data" (IQSS, Harvard)

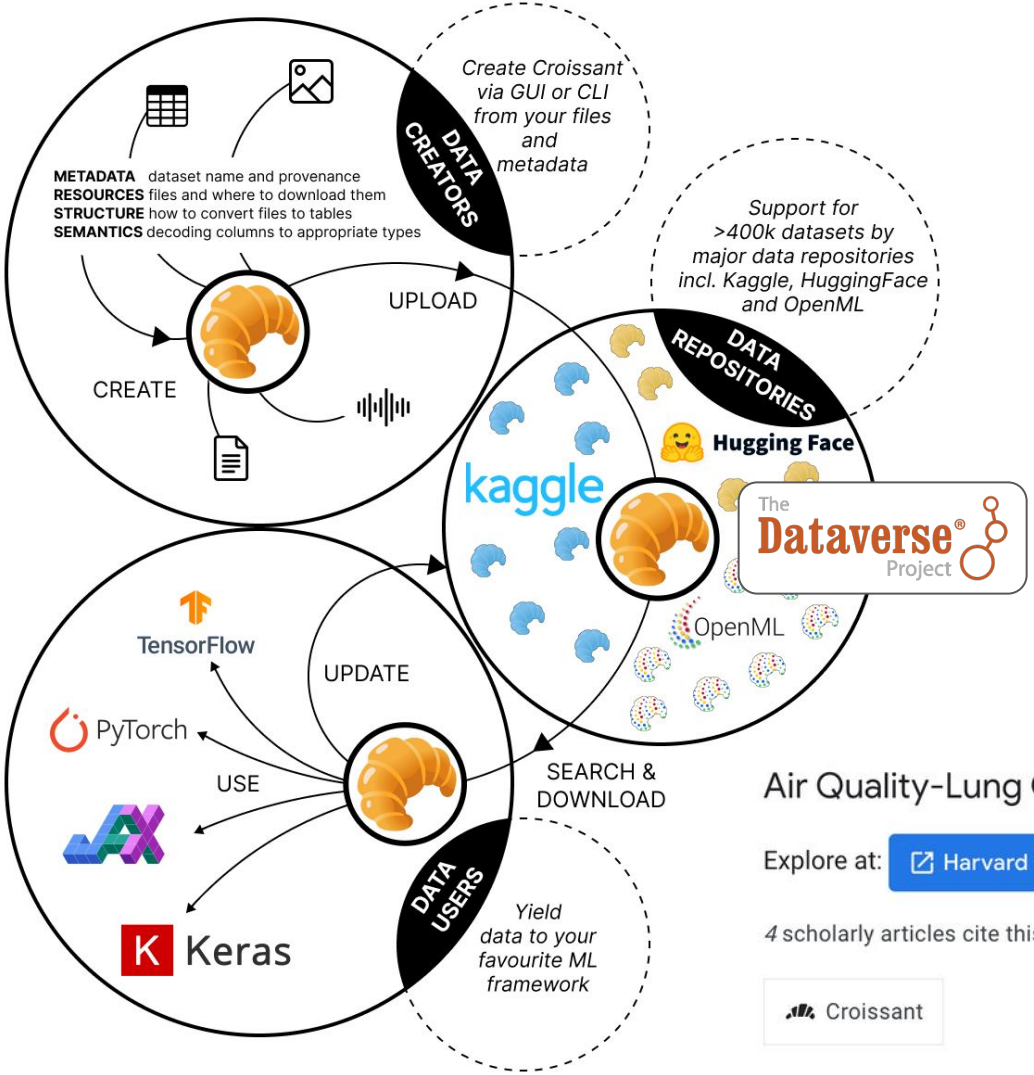
- Reads tabular data file variable names, labels, codes, data values
- Performs data analysis of two or more variables and crosstabulates, statistical regression, topic-modelling
- Connected to LLM AI for AI-generated responses
- Natural language instructions/questions processed as SQL query in Dataverse
- Only 181 lines of Python code with Shiny app and OpenAI's ChatGPT
- Supports multiple languages



- TurboCurator
- Knowledge Graph Extraction via LLM
- Ask The Data

Croissant





Air Quality-Lung Cancer Data

Explore at: Harvard Dataverse | dataver...

4 scholarly articles cite this dataset (View in Google Scholar)

Croissant

zenodo

Published September 26, 2024 | Version v1

Presentation | Open

Building natural language interface for Dataverse network based on Croissant ML standard

Vyacheslav Tykhonov (Researcher) [1]

Show affiliations

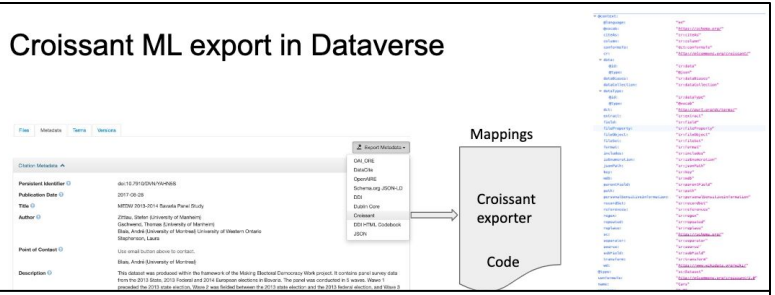
The new distributed network vision for AI is to create a shared data interface by querying multiple data nodes simultaneously. This distributed approach is based on the agile, community-driven standard called Croissant ML, allowing users to query and understand responses from various data platforms that support the standard, such as Dataverse, Kaggle, HuggingFace, and OpenML. The results are processed in a standardized way, converting metadata into a knowledge graph integrated with ontologies, and ingesting structured content into Large Language Models (LLMs) that act as reasoning engines, interfacing between humans and AI. The prototype enables "chatting" with individual data nodes in the network while considering ethical and privacy constraints, using only information shared through open metadata records.

Files

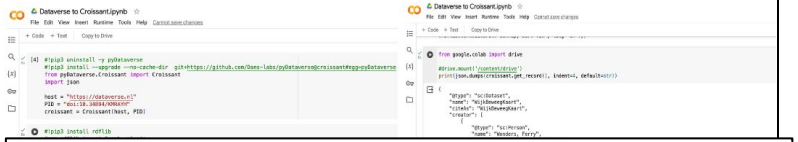
https://zenodo.org/records/13842869

Test it out:
https://ai.muse-it.eu/?url=https://dataverse.jpl.nasa.gov/dataset.xhtml?persistentId=doi:10.48577/jpl.HEMWZF

Croissant ML export in Dataverse



Experimental (graph) Croissant transformations in pyDataverse



Local intelligence built on Dataverse + Llama3:8b + Graph

Dataverse language Interface

Enter your question or DOI of some dataset, for example, doi:10.7910/DVN/XLJGUI

Question: Can you find a 2013 study on environmental policies in Bavaria?

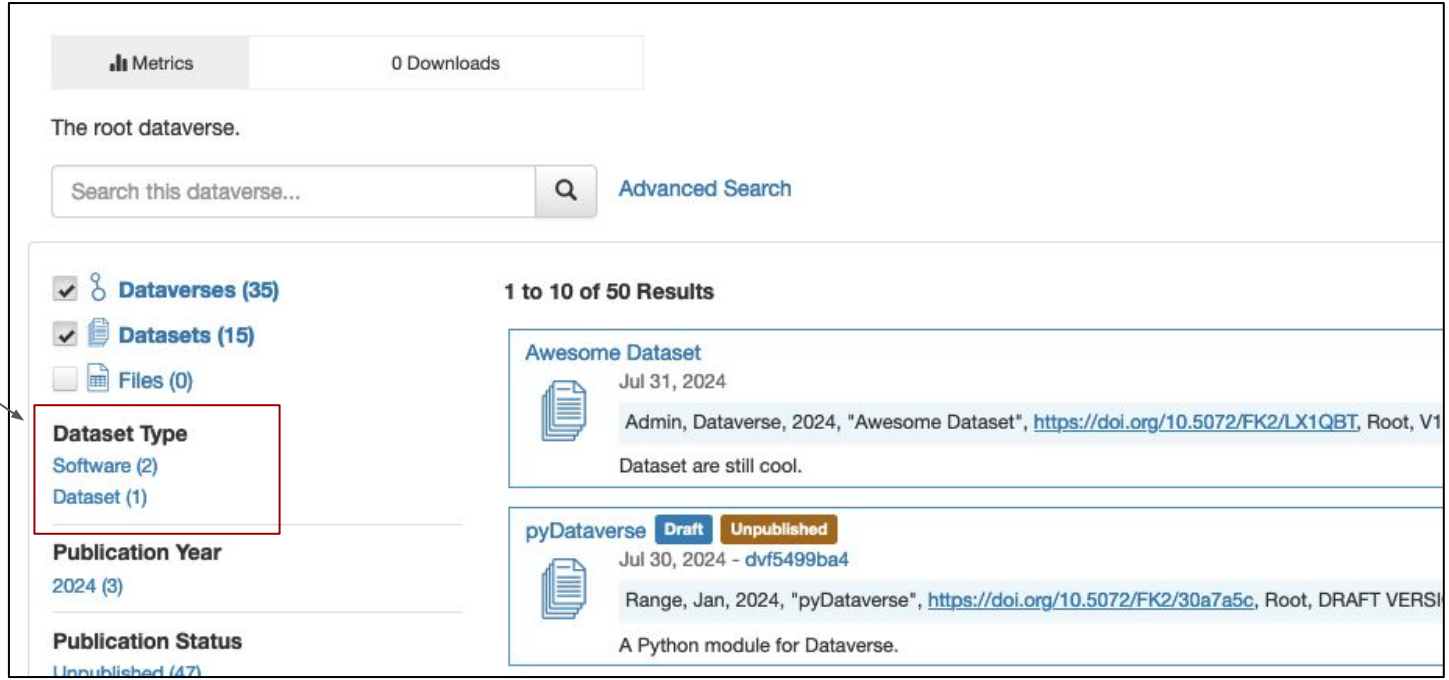
Get Response

Click "Chat" button if you want to chat with some dataset

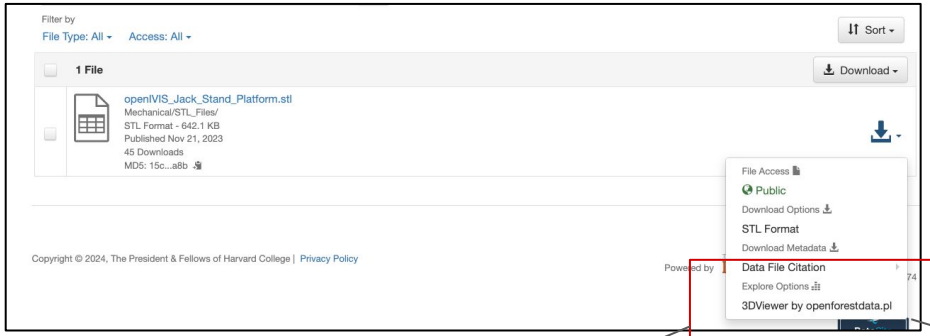
type:"dataset" AND (description:"study" OR title:"environmental policies" OR keyword:"environmental policies" OR description:"environmental policies" OR keyword:"study" OR title:"study") AND (description:"Bavaria" OR keyword:"Germany" OR keyword:"Bavaria" OR title:"Germany" OR title:"Bavaria" OR description:"Germany") AND (keyword:"2013" OR description:"2013" OR title:"2013")

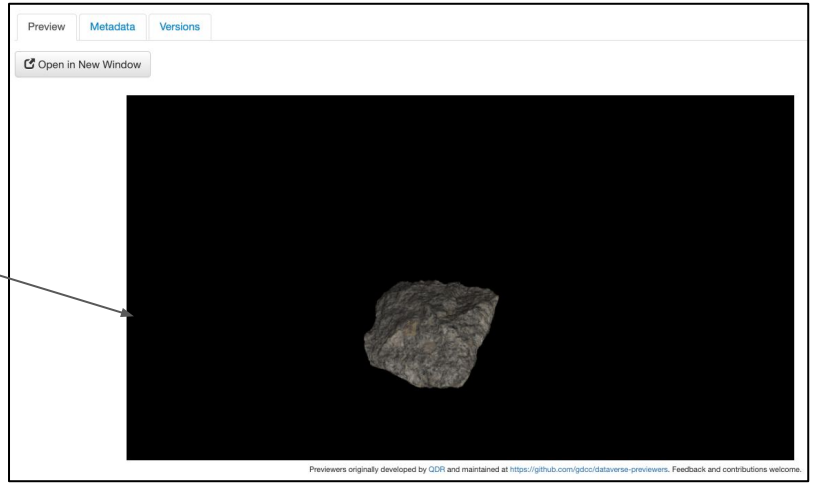
[Chat] Zittlau, Stefen; Gschwend, Thomas; Blais, André; Stephenson, Laura, 2017, "MEDW 2013-2014 Bavaria Panel Study", https://doi.org/10.7910/DVN/YAHN5S, Harvard Dataverse, V1

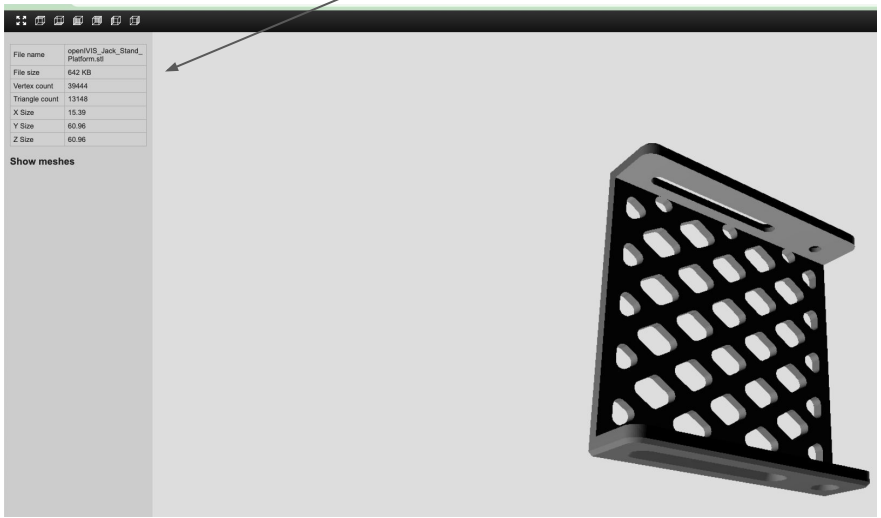
Dataset that contains the Croissant exports for each dataset in Harvard Dataverse



https://github.com/IQSS/dataverse/pull/10694







The file in the screenshot: https://dataverse.harvard.edu/file.xhtml?fileId=7559161&version=1.1

https://github.com/IQSS/dataverse.harvard.edu/issues/256

Deluge of Large Data

2004 - 2023: < 70TB

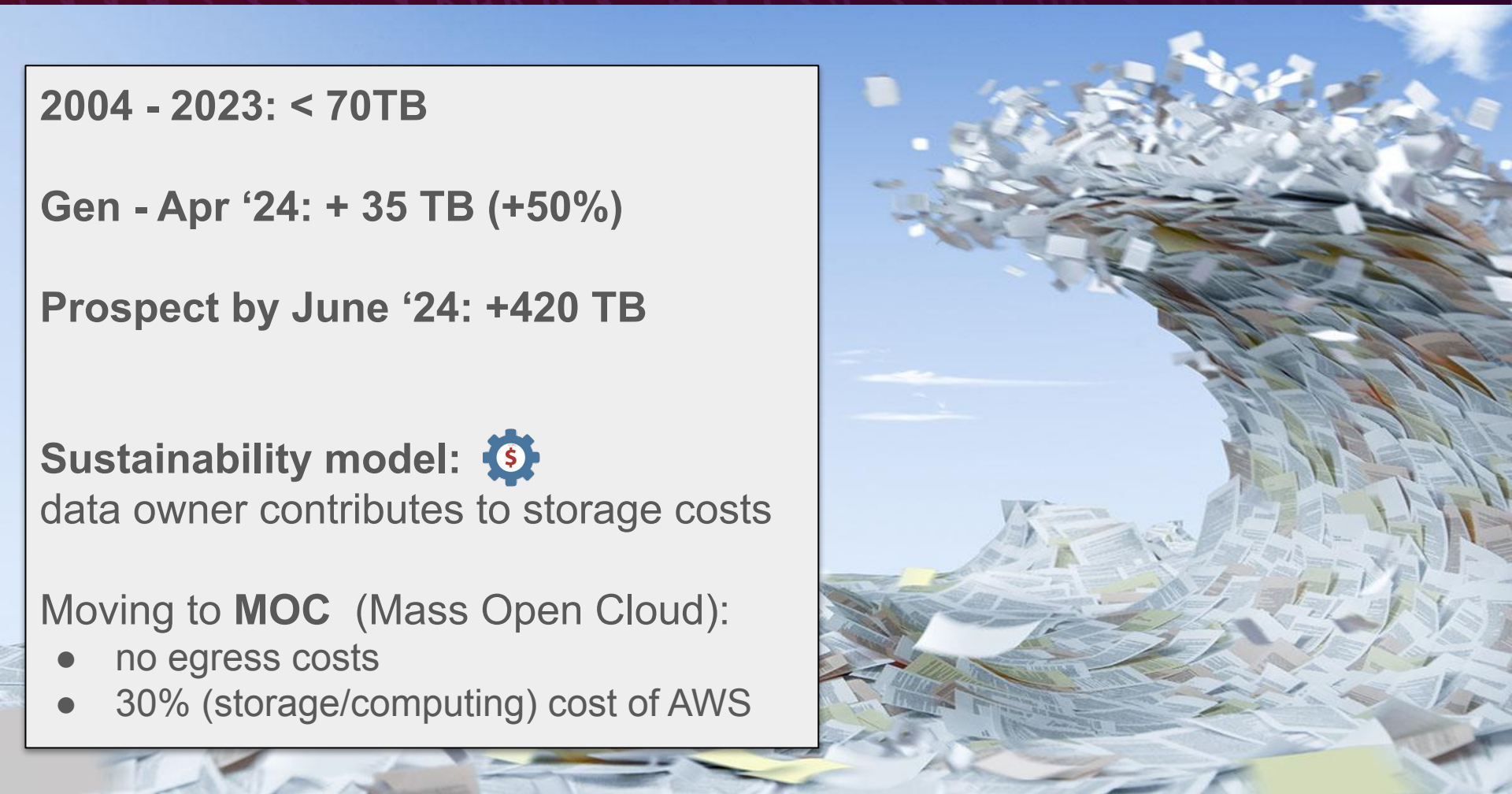
Gen - Apr ‘24: + 35 TB (+50%)

Prospect by June ‘24: +420 TB

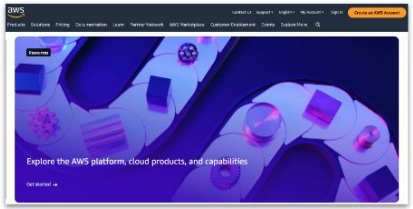
Sustainability model:
data owner contributes to storage costs

Moving to **MOC** (Mass Open Cloud):

- no egress costs
- 30% (storage/computing) cost of AWS



Large data support infrastructure

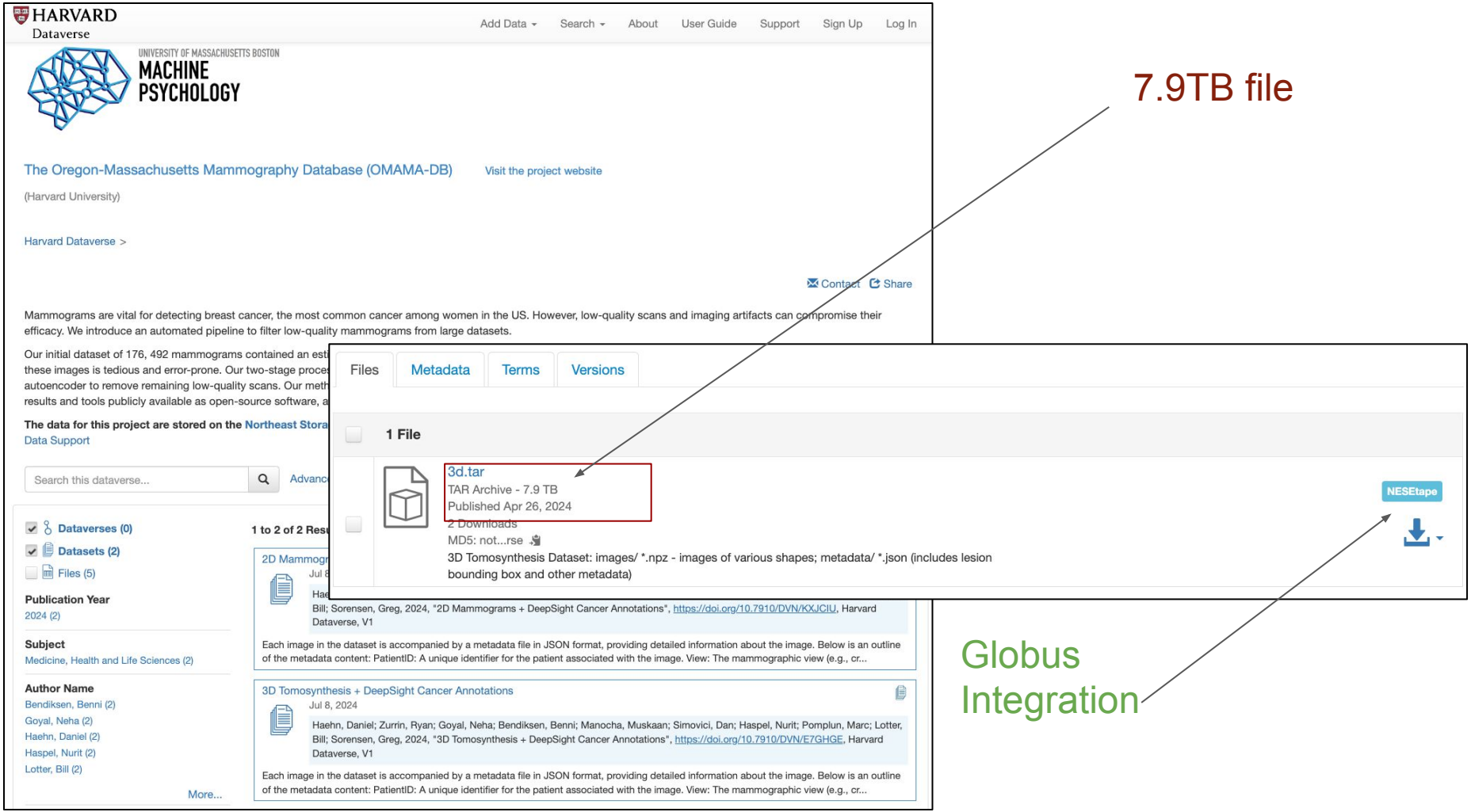


MGHPCC MASSACHUSETTS GREEN HIGH PERFORMANCE COMPUTING CENTER

NERC New England Research Cloud

Northeast Storage Exchange (NESE)

Category	Storage Options	Description
Consultations	-	Basic and extended consultations to choose best service offering
Data Curation	-	Curation consultations and other services
Basic Service	NESE Tape NESE Disk	Dynamic file access for some files, delayed access for others
On-Demand Service	NESE Disk w/S3 AWS S3	Dynamic file access option using AWS S3 or NESE disk w/S3 mounted containers
Cold Storage	NESE Tape AWS Glacier	Cold storage for rarely accessed data
Custom	Combination	Custom solutions using multiple storage and access options


HARVARD Dataverse
Add Data
Search
About
User Guide
Support
Sign Up
Log In
UNIVERSITY OF MASSACHUSETTS BOSTON
MACHINE PSYCHOLOGY
The Oregon-Massachusetts Mammography Database (OMAMA-DB)
Visit the project website
(Harvard University)
Harvard Dataverse >
Contact
Share
Mammograms are vital for detecting breast cancer, the most common cancer among women in the US. However, low-quality scans and imaging artifacts can compromise their efficacy. We introduce an automated pipeline to filter low-quality mammograms from large datasets.
Our initial dataset of 176, 492 mammograms contained an esti
these images is tedious and error-prone. Our two-stage proces
autoencoder to remove remaining low-quality scans. Our meth
results and tools publicly available as open-source software, a
The data for this project are stored on the Northeast Stora
Data Support
Search this dataverse...
Advanc
Dataverses (0)
Datasets (2)
Files (5)
Publication Year
2024 (2)
Subject
Medicine, Health and Life Sciences (2)
Author Name
Bendiksen, Benni (2)
Goyal, Neha (2)
Haehn, Daniel (2)
Haspel, Nurit (2)
Lotter, Bill (2)
More...
1 to 2 of 2 Resu
2D Mammogr
Jul 8
Hae
Bill; Sorensen, Greg, 2024, "2D Mammograms + DeepSight Cancer Annotations", https://doi.org/10.7910/DVN/KXJCIU, Harvard Dataverse, V1
Each image in the dataset is accompanied by a metadata file in JSON format, providing detailed information about the image. Below is an outline of the metadata content: PatientID: A unique identifier for the patient associated with the image. View: The mammographic view (e.g., cr...
3D Tomosynthesis + DeepSight Cancer Annotations
Jul 8, 2024
Haehn, Daniel; Zurrin, Ryan; Goyal, Neha; Bendiksen, Benni; Manocha, Muskaan; Simovici, Dan; Haspel, Nurit; Pomplun, Marc; Lotter, Bill; Sorensen, Greg, 2024, "3D Tomosynthesis + DeepSight Cancer Annotations", https://doi.org/10.7910/DVN/E7GHGE, Harvard Dataverse, V1
Each image in the dataset is accompanied by a metadata file in JSON format, providing detailed information about the image. Below is an outline of the metadata content: PatientID: A unique identifier for the patient associated with the image. View: The mammographic view (e.g., cr...
Files
Metadata
Terms
Versions
1 File
3d.tar
TAR Archive - 7.9 TB
Published Apr 26, 2024
2 Downloads
MD5: not...rse
3D Tomosynthesis Dataset: images/ *.npz - images of various shapes; metadata/ *.json (includes lesion bounding box and other metadata)
NESEtape
7.9TB file
Globus Integration

Computing on the Data

Computing on Data in Harvard Dataverse

Need: Researchers want to compute on HDV datasets

Challenges

May not be possible to:

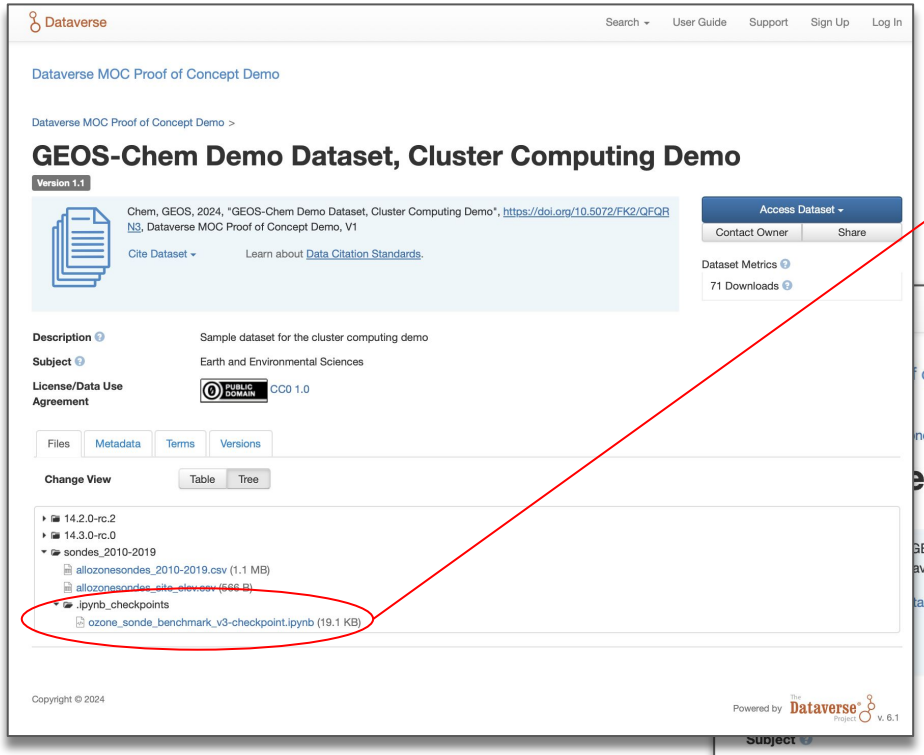
- Move/copy data files from HDV data storage
- Perform difficult computations using local resources

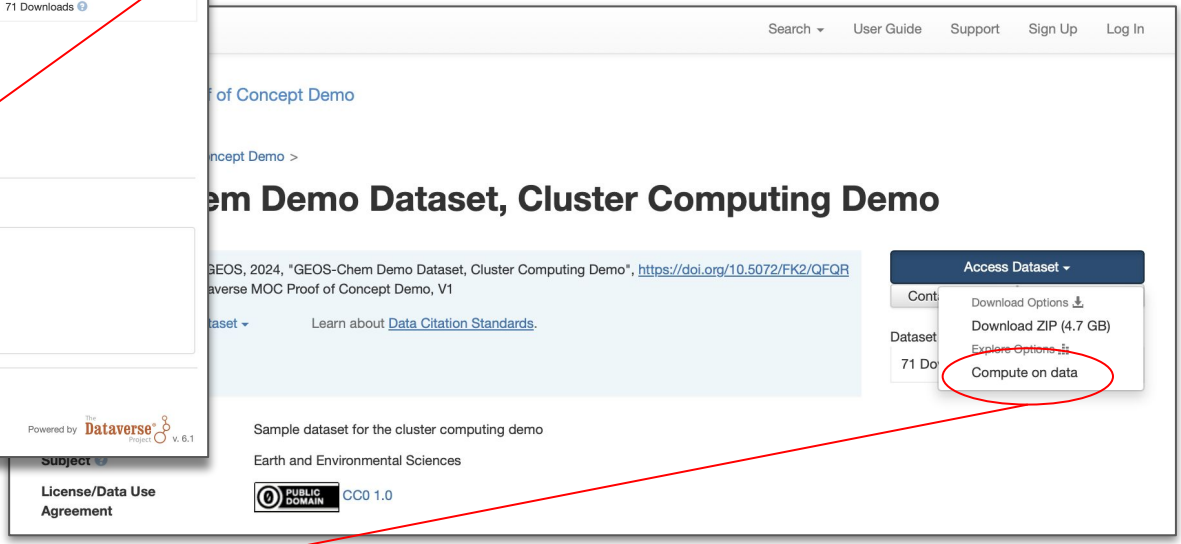
Approaches

1. Run containerized Dataverse & compute where the data is stored on HPC (current PoC)
2. DV - Open OnDemand Integration: Move copy of files to HPC cluster (PoC in June 2025)

PoC: Run containerized Dataverse on HPC

If Dataverse sees a (python) notebook, the new menu item "**Compute on data**" appears in the *Access Dataset* drop down menu





This menu will launch the JupyterLab VM with the pre-loaded notebook taken from the dataset.
All files in this collection are seen as **local** to the Jupyter instance. Python will simply load them into memory for computing purposes.

Computing on the data

jupyter dataverse_geos_chem Last Checkpoint: yesterday

File Edit View Run Kernel Settings Help Trusted

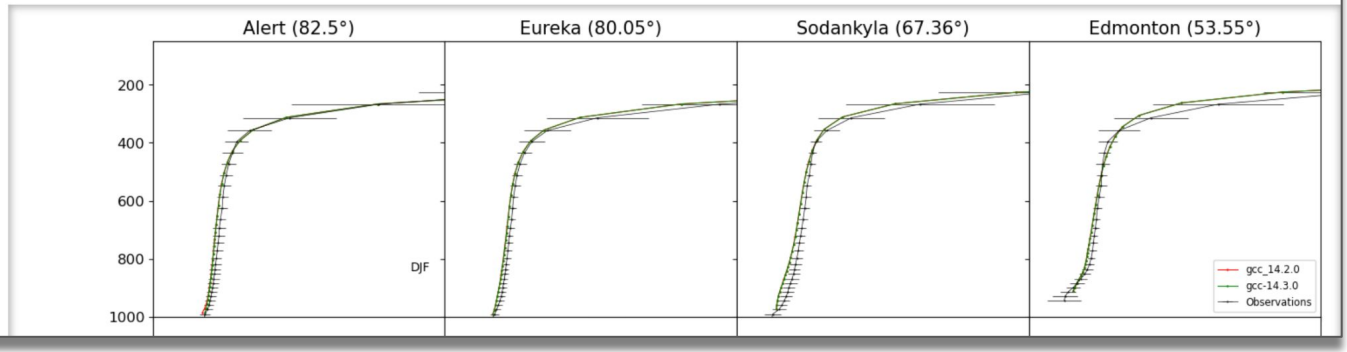
Markdown JupyterLab Python 3 (ipykernel)

```
    #pdf_pages.close()
```

Create plots of GEOS-Chem model output vs. observational data

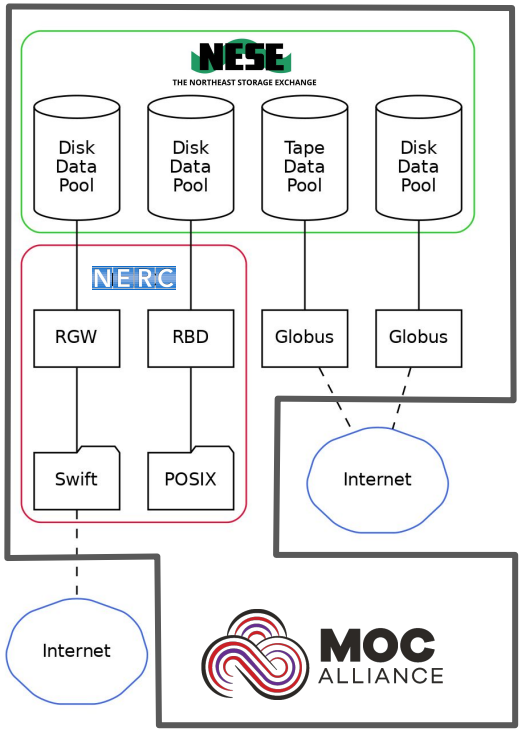
A new figure will be generated showing GEOS-Chem data vs. ozonesonde sites for each meteorological season (winter = DJF, spring = MAM, summer = JJA, fall = SON). Close each plot window to move to the next plot.

[6]:
```
# Finally, generate plots of GEOS-Chem data vs. ozonesondes
# These are used for GEOS-Chem benchmarking and model evaluation
make_benchmark_models_vs_sondes_plots(
    obs_data_file,
    obs_site_file,
    ref_filepaths,
    ref_label,
    dev_filepaths,
    dev_label,
)
```

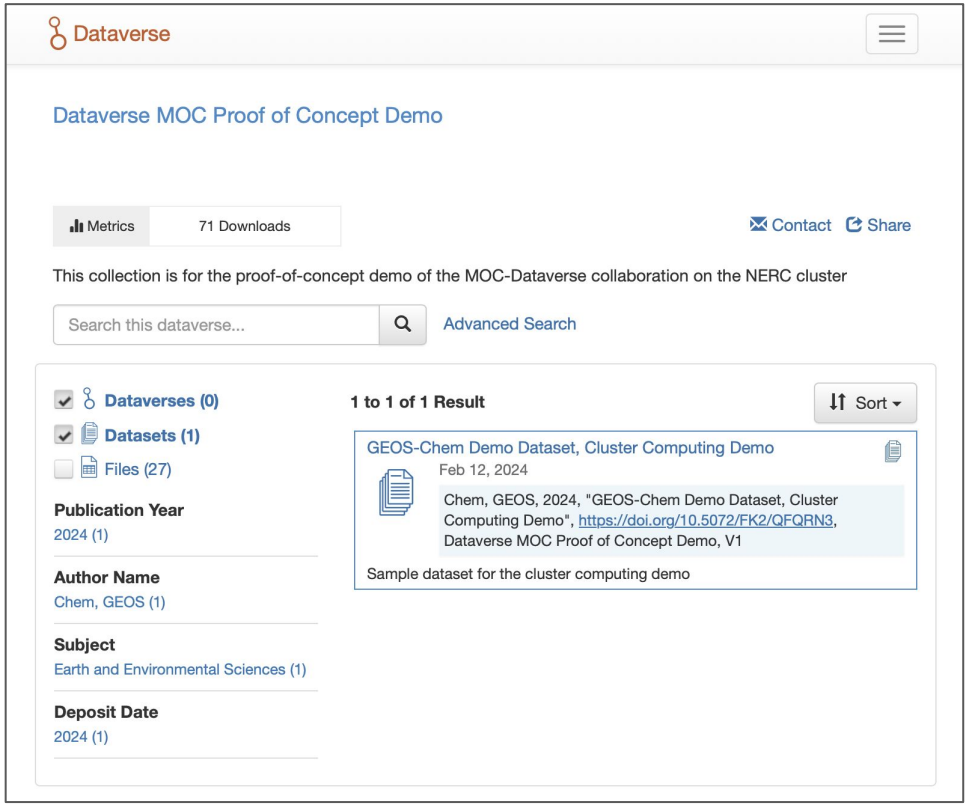


Then some nice computation happens

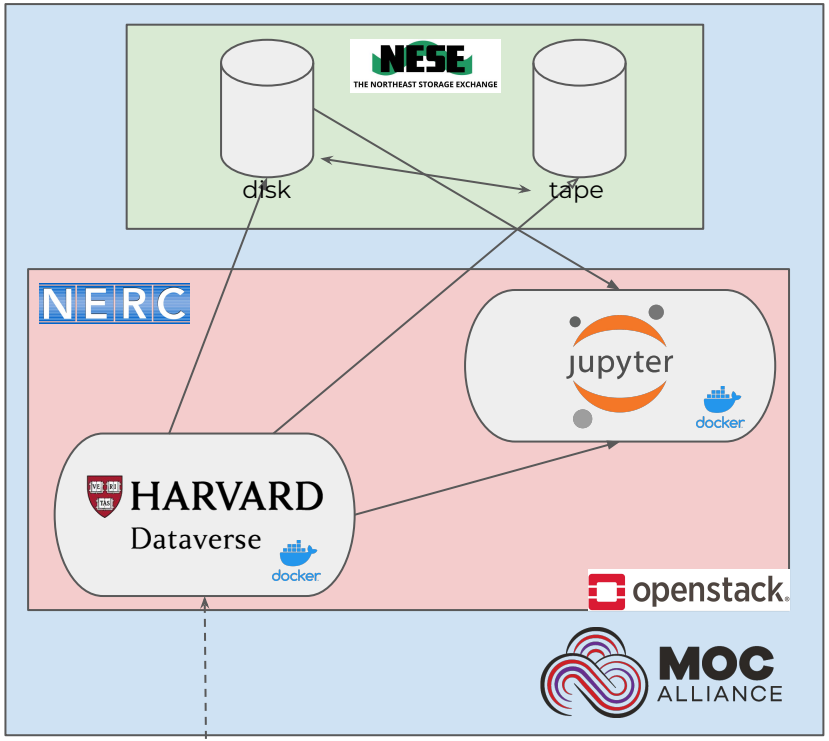
Connecting Dataverse to HPC infrastructure:



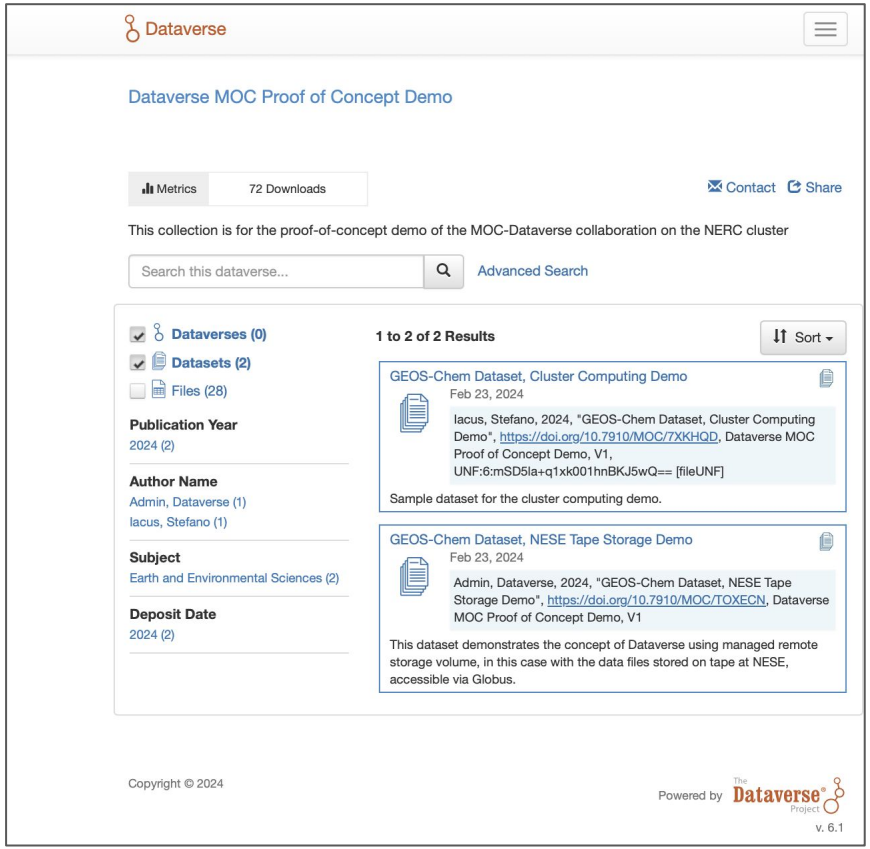
NESE — NERC Data Storage Stack



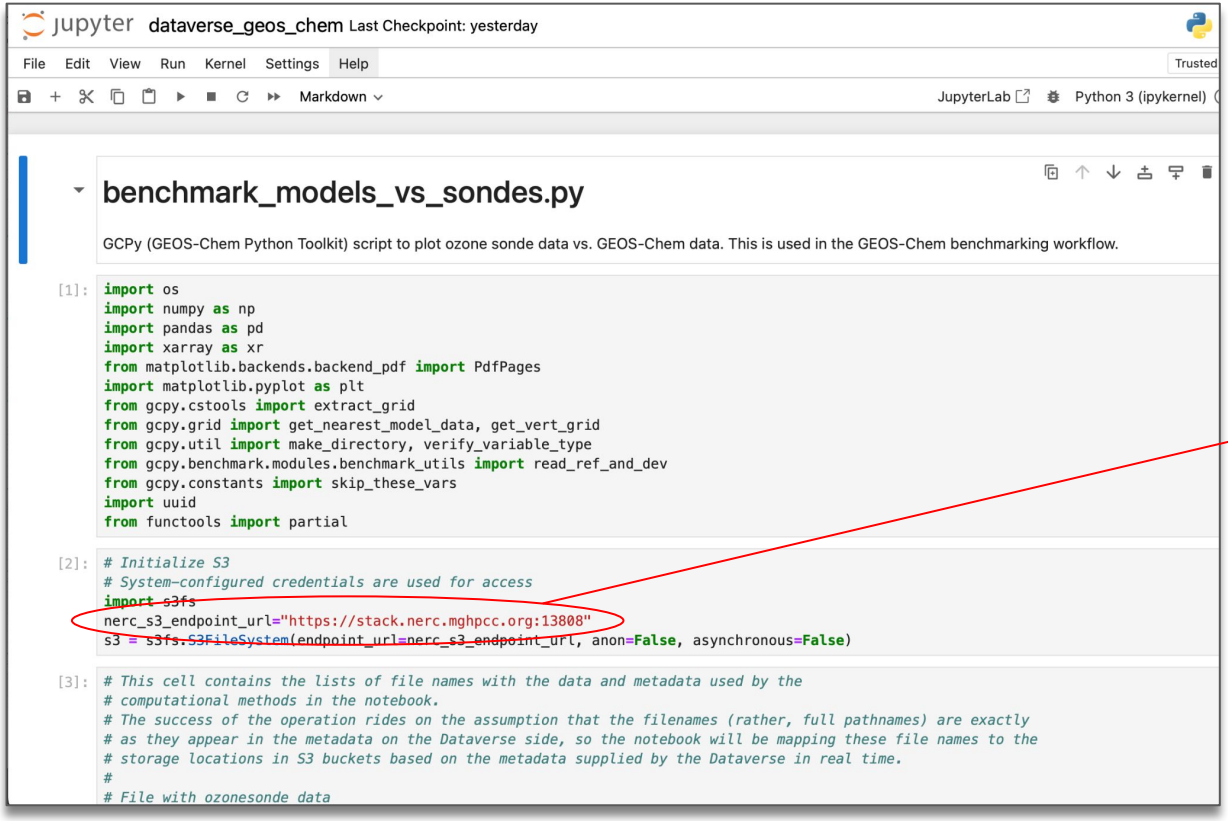
Connecting Dataverse to HPC infrastructure: MOC



happy Harvard Dataverse user (only NERC PI's will be able to run compute)



Computing on the data



NERC S3 endpoint for the containerized storage (which exists on NESE)

Computing on the data

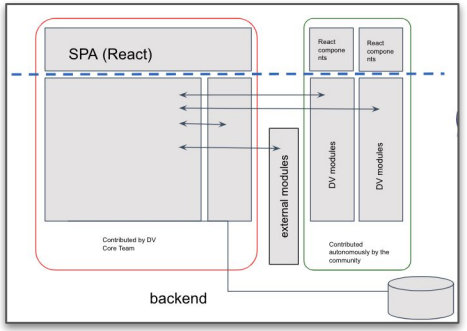
Automatic mapping of local file names (local to the python notebook) to Harvard Dataverse file pointers on NESE

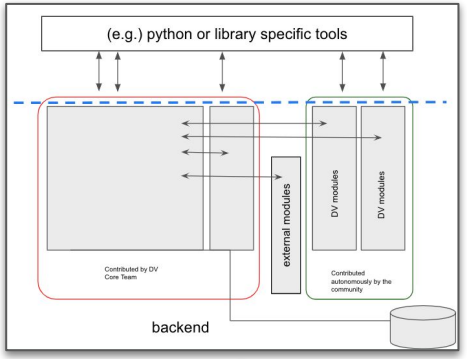
```
mapping file pathnames as listed in the dataset metadata to the direct storage locations:
sondes_2010-2019/allozonesondes_2010-2019.csv -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8fa95075-22edad4355c8
sondes_2010-2019/allozonesondes_site_elev.csv -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8fa950f3-ed27dd9b2f0a
14.3.0-rc.0/GCClassic/FullChem/OutputDir/GEOSChem.SpeciesConc.20190101_0000z.nc4 -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8
fa81861-a21e0a10e8a5
14.2.0-rc.2/GCClassic/FullChem/OutputDir/GEOSChem.SpeciesConc.20190101_0000z.nc4 -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8
fa4ee6e-12fc2fa05bf8
14.2.0-rc.2/GCClassic/FullChem/OutputDir/GEOSChem.SpeciesConc.20190201_0000z.nc4 -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8
fa4cd02-4a684a55b7dc
14.3.0-rc.0/GCClassic/FullChem/OutputDir/GEOSChem.SpeciesConc.20190201_0000z.nc4 -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8
fa7ee17-5242cdff4a74
14.2.0-rc.2/GCClassic/FullChem/OutputDir/GEOSChem.SpeciesConc.20190301_0000z.nc4 -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8
fa53f9b-7d6cae9694b7
14.3.0-rc.0/GCClassic/FullChem/OutputDir/GEOSChem.SpeciesConc.20190301_0000z.nc4 -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8
fa85f90-048bd360915f
14.2.0-rc.2/GCClassic/FullChem/OutputDir/GEOSChem.SpeciesConc.20190401_0000z.nc4 -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8
fa4f6fe-b811828db8aa
14.3.0-rc.0/GCClassic/FullChem/OutputDir/GEOSChem.SpeciesConc.20190401_0000z.nc4 -> s3://mocpocdemocontainer/10.5072/FK2/QFQRN3/18d8
```

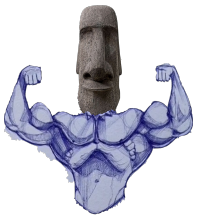
An upcoming version of **pyDataverse** will automatically generate these mappings for general cloud systems.

The re-arch project (last 12 months)

Goals	Approach
• **Modernize** the application	• Single Page Application (**SPA**)
• **Separate backend** & **frontend**	• Native support for **localization**
• Increase **interoperability**	• Native support for **accessibility**
• **Modularize** backend & frontend	• **Full automatic testing**
• **Speed up development**	• Improved **modularity**
• Deploy **new UI/UX ideas**	• “**Plug&play**” module approach
• **Shorten release time**	• **Lighter** modules
• **Empower** the **community**	• Optimization of backend





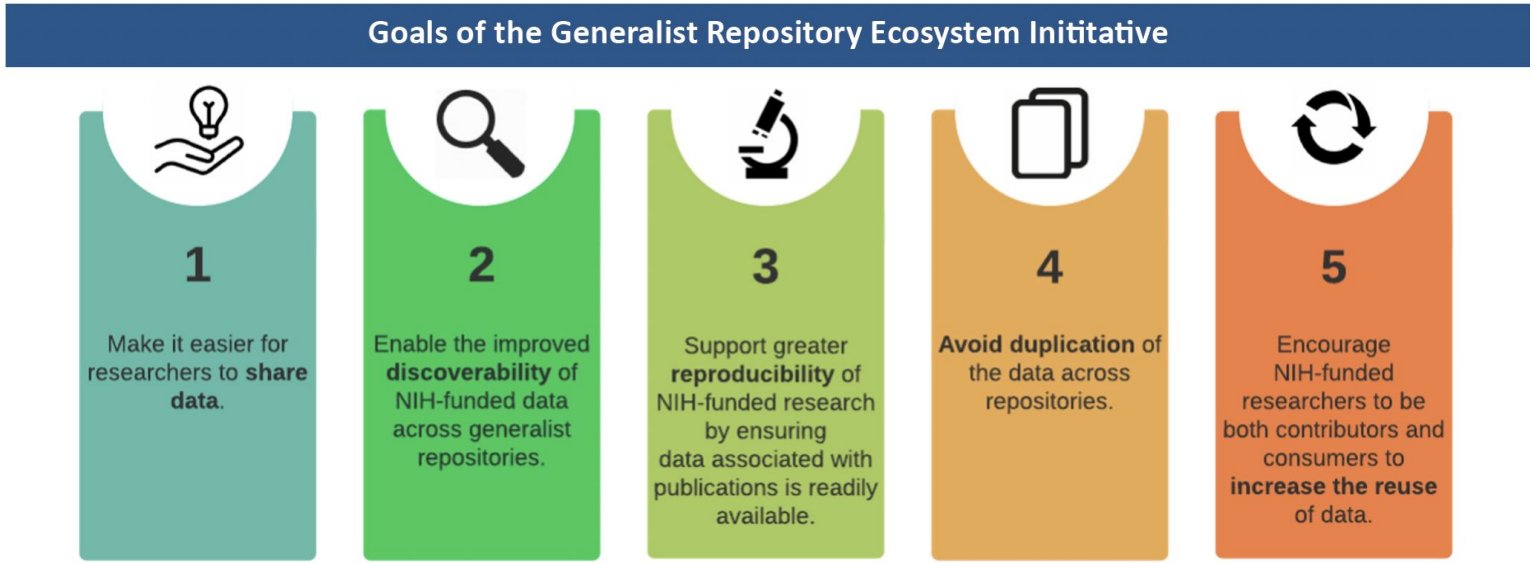


Grants and Collaborations

NIH Generalist Repository Ecosystem Initiative (GREI)

The mission of GREI is to establish a common set of capabilities, services, metrics, and social infrastructure; raise general awareness and facilitate researchers to adopt FAIR principles to better share and reuse data.

This initiative will further enhance the biomedical data ecosystem and help researchers find and share data from NIH-funded studies in generalist repositories.



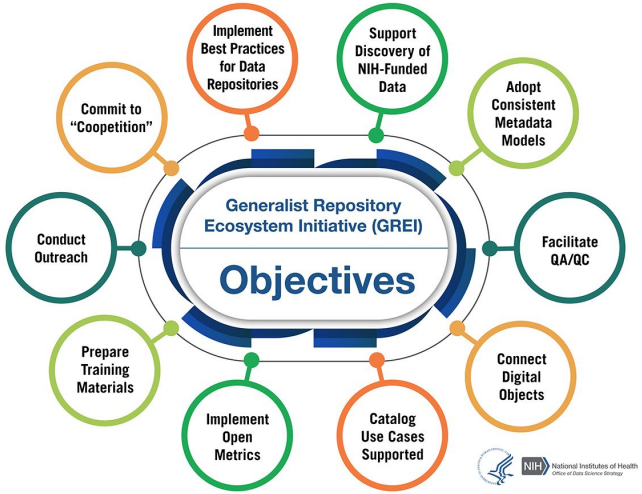
NIH Funding: 3OT2DB000001, 3OT2DB000002, 3OT2DB000003, 3OT2DB000004, 3OT2DB000005, 3OT2DB000006, 3OT2DB000013

NIH GREI (2022-ongoing)

NIH GREI (Generalist Repository Ecosystem Initiative)

- Current programs and activities involved:
  - Remote Large Storage Support
  - Controlled Vocabularies for Biomedical
  - Discovery for Metadata (e.g. Data Documentation Initiative (DDI))
  - Computational Workflows
  - Harvesting and Sharing Metadata Across Repositories
  - Usage Metrics - Make Data Count Support
  - Improvements for Sensitive Data Support
  - Evaluation and Evolution of Architecture
  - NIH Data Management Plans
  - Community Repository Training
  - Support for Research Objects (beyond datasets)

Participating Repositories



HARVARD Dataverse

NIH GREI

IQSS

Current Features

Installations

Collections

Datasets

Files

NIH OTA Adds…

Datasets

- New Workflows for **Large Data Support** (Globus, demo)
- **Remote** Data Support (TRSA)
- Flexible **Biomedical Metadata** Support through External Vocabularies and Data Dictionaries (UMLS, MeSH)
- Investigate CEDAR integration

Files

- Additional Metadata for **Code files** (Codemeta)
- Support for **Replication Packages** through Workflows and Containers
- **Sensitive Data Support** through Differential Privacy (OpenDP, DataTags, PSIprivacy)
- Encryption

- Usage Metrics
- UX/UI Enhancements
- New APIs
- Interoperability
- Metadata Harvesting
- Curation Services
- Training and Outreach

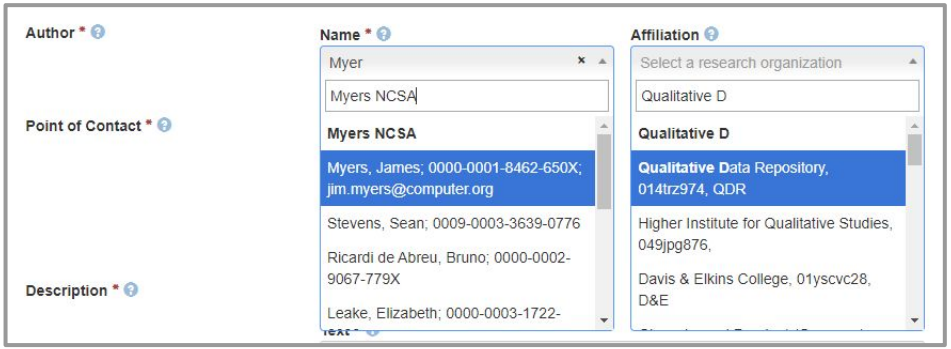
ORCID Global Participation Grant awarded to GDCC

- Working with the Dataverse Community and Global South Dataverse Instances to:
  - Deploy current ORCID/ROR functionality
  - Verify/Promote addition of published datasets to ORCID profiles (via DataCite DataCommons)
  - Design/test new DOI lookup for Related Publications
  - Present results to the Dataverse Community

** If you're interested in deploying the existing ORCID/ROR capabilities and/or in helping to design/test new ORCID-related functionality, please contact Jim Myers (qqmyers@hotmail.com)

Dataverse 6.4 ORCID/ROR Support

- Lookup of People and Organizations via ORCID and ROR
- Can be configured for Author (name/affiliation), Depositor, Funding Information/Agency and other fields
- Edit:



Start typing a name, acronym, or other information from a profile

Select from matching values

- Dataset Page:

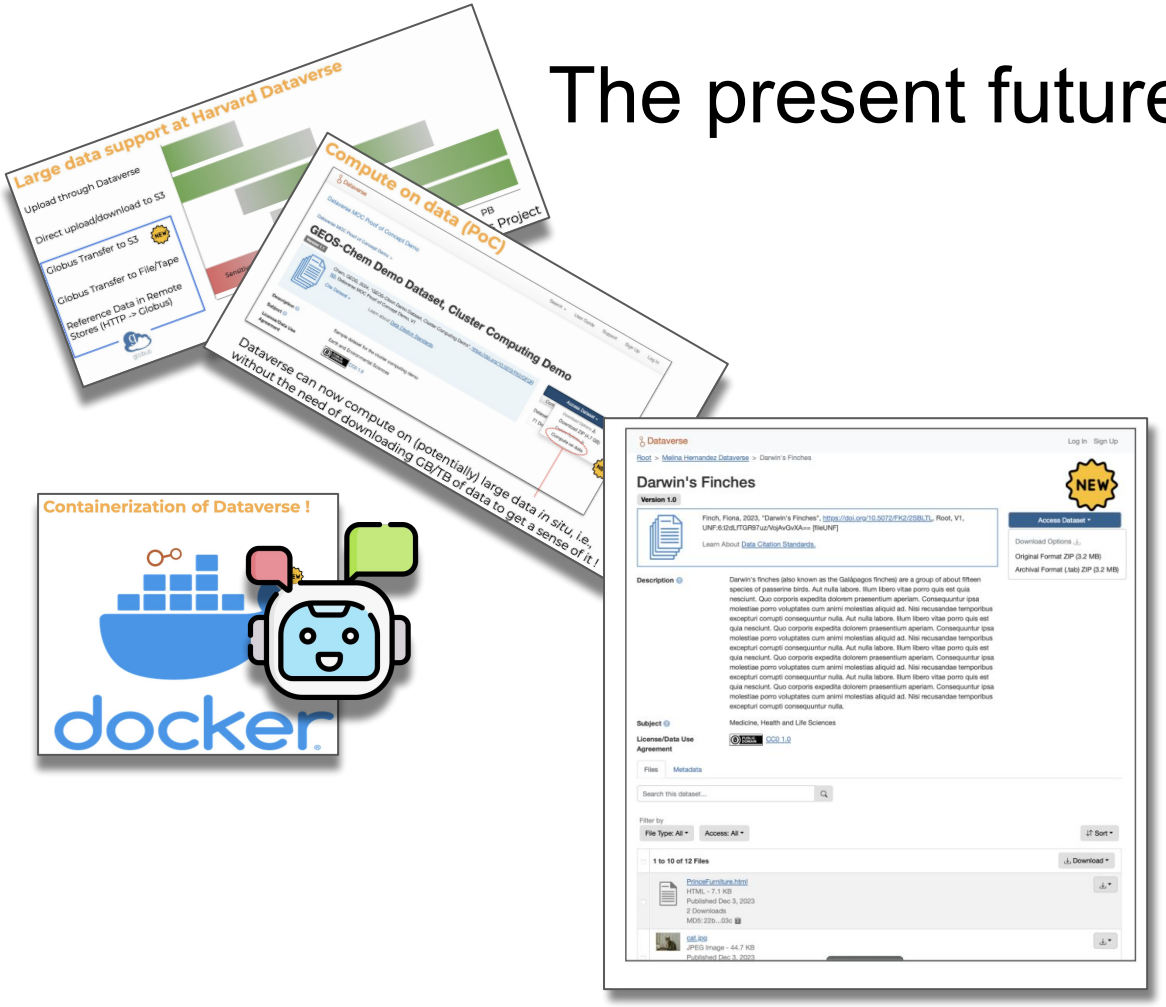
Display shows name and a live link to the ORCID/ROR profile

Exported metadata contains the ORCID/ROR id for machine processing

Try it now at https://demo.dataverse.org

New and Upcoming Feature…

The present future …



SPA

- New Single Page Application (SPA)
- Large Data Support/ Globus Transfer
- Remote Storage & Sensitive Data
- Big Data & Computation
- AI-powered tools
- Harvard and Community research projects and integrations
- Indigenous data support - TK Labels

New or Upcoming Features & Services

New

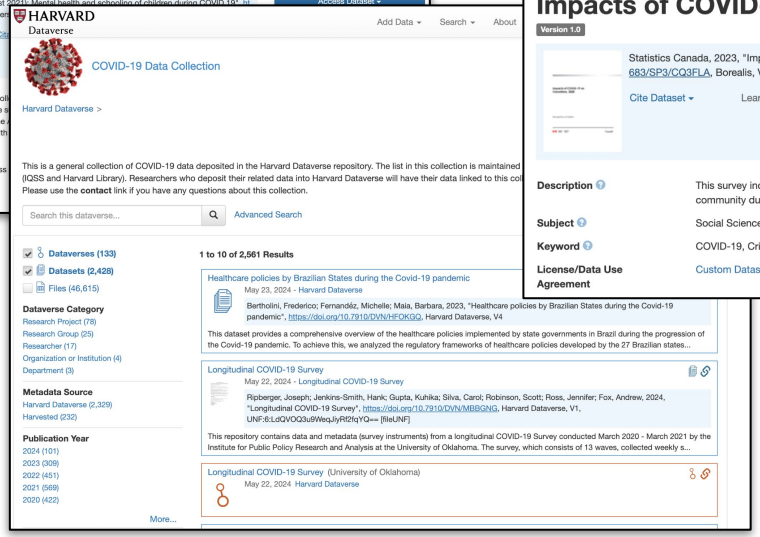
Search and Facet by License: New ability to search and facet by dataset license (e.g., CC0)
New Contributor Guide: The UX Working Group released a new Dataverse Contributor Guide.
File-Level Retention Periods: Dataverse now supports new file-level retention periods. See the Retention Periods section of the guide for details.
Support for Multiple Persistent Identifier Providers: Support for using multiple PID provider accounts (e.g., DOI, Handle, PermaLink). Great for consortia.

Forthcoming

Traditional Knowledge Labels: Support for datasets using the TK Labels controlled vocabulary
Dataverse Marketplace: Centralized location for simple setup of configurable plug ins such as exporters, external tools, etc.
External Search: New External Tool type, “search”, for external API-enabled search engines to search Dataverse content in different ways
Dataverse Metrics Hub: A new service providing metrics about the Dataverse Project, Harvard Dataverse, and the Dataverse network via APIs

The Global Dataverse Community

Global Research Community…



The State of the Dataverse Community is strong!

Dataverse Community (users, developers, researchers, librarians, data scientists and more)

- 120+ installations across the world
- 35 countries
- ~1000 subscribers to the Google Group
- ~100 people in chat.dataverse.org (Zulip)
- 253 “DV Community” Slack user
- 1600+ GitHub issued opened by the community
- 1300+ pull requests made by the community
- 185+ Github contributors to the main code base
- 186 videos on DataverseTV
- 189 community calls since 2016
- Many working groups, interest groups, community groups, meetings, etc.

The Data (dataverse.org/metrics)

- 123 installations
- 16,600 Dataverse Collections*
- 426,000 Datasets*
- 6,120,000 Files*
- 86,500,000 File Downloads*

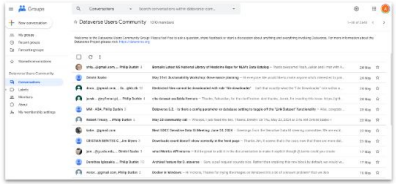
* metrics collected from 96 installations (running 4.9 and newer)

Dataverse Google Group

Recent Discussions:

- Technical setup & development questions
- Community calls & meetings
- Integrations & externals tools
- Preservation & FAIR Principles
- Community best practices
- Geospatial data integration
- User & Developer Guides
- Global Dataverse Community Consortium (GDCC)
- Surveys & community feedback

Dataverse Google Group



https://groups.google.com/g/dataverse-community

https://groups.google.com/g/dataverse-community

Annual Dataverse Community Meeting

- 2015 - IQSS, Harvard: Common Models and APIs for Data Publishing and Citation Workshop
- 2016 - Harvard Medical School, Harvard: Fostering the Dataverse Community
- 2017 - IQSS, Harvard: Dataverse and the Data Lifecycle
- 2018 - IQSS, Harvard: Dataverse in the Age of Data Science
- 2019 - IQSS, Harvard: Data Sharing: Supporting Sustainability and Growth

1st virtual meetings:

- 2020 - Global Virtual Conference: Global COVID-19 Data Sharing
- 2021 - Global Virtual Conference: Automated CI/CD Testing, Installation and Deployment of a Dataverse Installation on a Cloud
- 2022 - Global Virtual Conference: Indigenous Data Sovereignty

1st Regional Community Meetings:

- 2023 - University of Minho, Portugal: Sharing data for future generations - sustainability, trust, and community building
- 2024 - Texcoco, Mexico (CIMMYT): Harvesting data from the field to the cloud

10 years of community meetings!

dataverse.org/events

Dataverse Community Meeting 2025

June 9-12 at the University of North Carolina at Chapel Hill

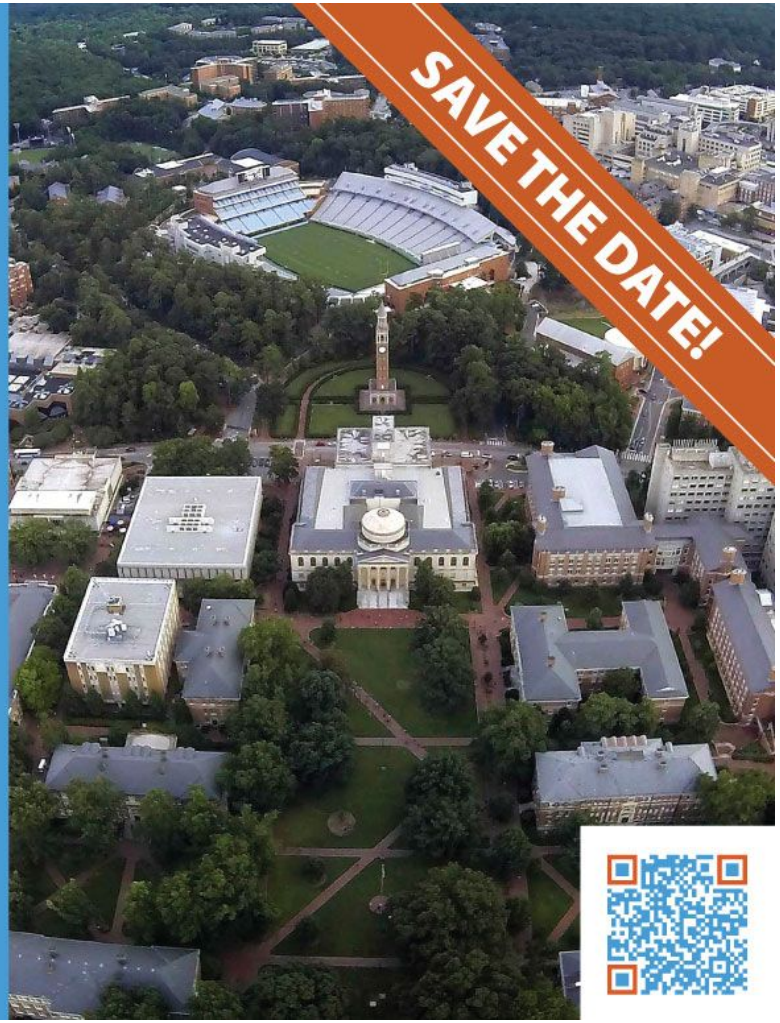
MORE INFORMATION COMING SOON!

https://dcm2025.hsites.harvard.edu/

#Dataverse2025

UNC RESEARCH Data Management Core

The Dataverse® Project



Thank You!

Sonia Barbosa
Associate Director, Dataverse, Data Curation, and The Murray Archive