Building Dataverse Communities that follow RDA Best Practices for Data Sharing and Management

The Dataverse® Project

Gustavo Durand, Jon Crabtree,
Philipp Conzett, Slava Tykhonov

http://bit.ly/RDABOFDV

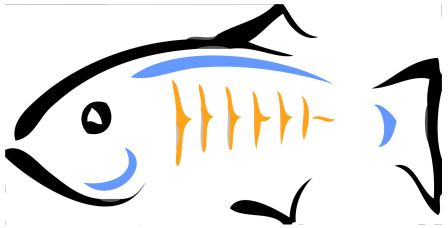
Introduction to Dataverse

Overview

- **An open-source platform 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) since 2006
- Development funded by IQSS and with grants, in collaboration with institutions around the world
- 12 on the core team - developers, designers, UI/UX, metadata specialists, curation team, leadership team

Dataverse Technology

Glassfish Server 4.1



Java SE8

Java EE7

- Presentation: JSF (PrimeFaces), RESTful API
- Business: EJB, Transactions, Asynchronous, Timers
- Storage: JPA (Entities), Bean Validation

Storage: Postgres, Solr, File System / Swift / S3

Dataverse Features - Data

- Persistent IDs / URLs
  - DataCite
  - Handle
- Automatically Generated Citations with attribution
- Compliant with FAIR and data citation principles
- Domain-specific Metadata
- Versioning
- File Storage
  - Local
  - Swift (OpenStack)
  - S3 (Amazon)
- *DataTags for Sensitive Data*

Dataverse Features - Users

- Multiple Sign In options
  - Native
  - Shibboleth
  - OAuth (ORCID, Github, Google, *Microsoft*)
- Dataverses within Dataverses
- Branding
- Widgets

Dataverse Features - Workflows

- Permissions
- Access Controls and Terms of Use
- Publishing Workflows
- Private URLs
- Upload / Download Workflows
  - Browser
  - Dropbox
  - Rsync (for big data “packages”)
  - *Remote Storage (TRSAs)*

Dataverse Features - Interoperability

- APIs
  - SWORD
  - Native
  - Metrics
- Harvesting (OAI-PMH)
  - Client
  - Server
- Modular External Tools
  - Explore vs Configure
  - Scope: Dataset / Datafile

Dataverse Roadmap

https://www.iq.harvard.edu/roadmap-dataverse-project

- Strategic Goals
- Implementation, Planning, Future

Dataverse Community

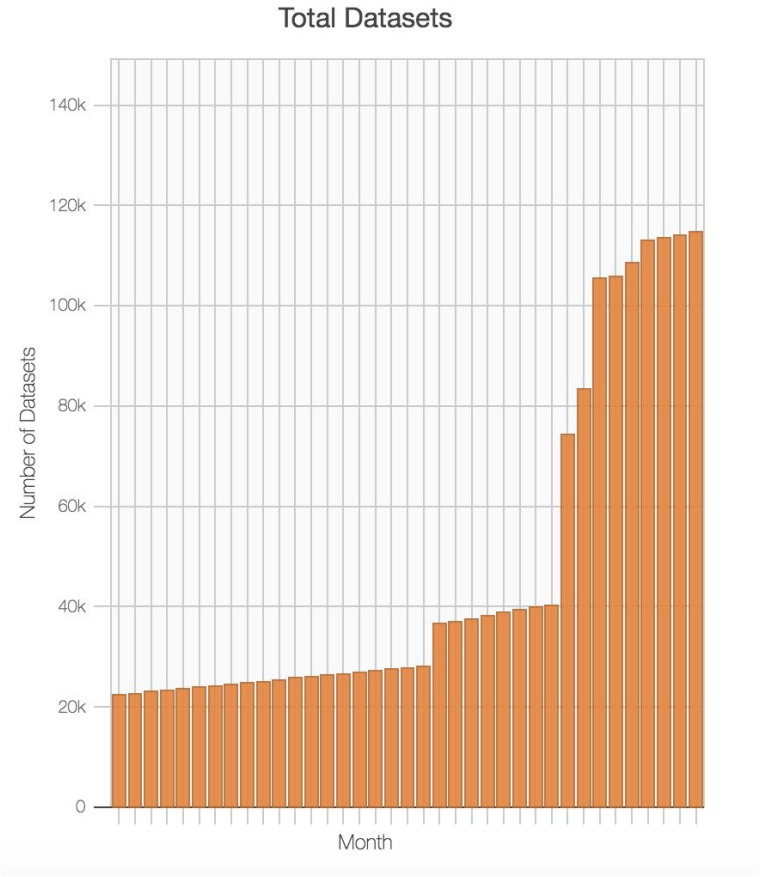
Dataverse Community

- **50** installations around the world

The Data (dataverse.org/metrics)

- 50 installations
- 5,500 Dataverses*
- 124,000 Datasets*
- 507,000 Files*
- 10,200,000 File Downloads*

* metrics collected from 26 installations



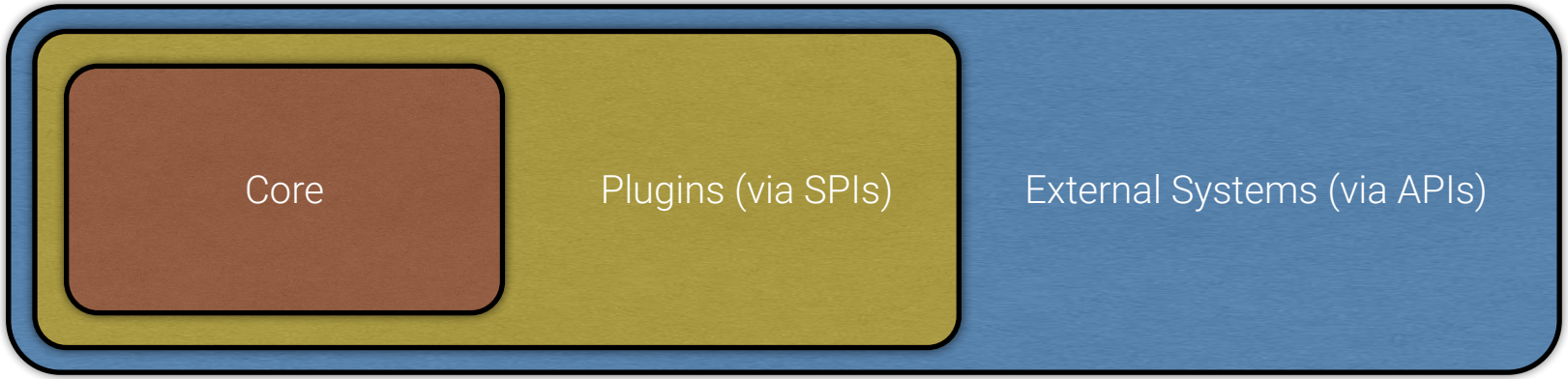
Dataverse Community

- 100+ Contributors
- Hundreds of members of the Dataverse Community - developers, researchers, librarians, data scientists
  - Dataverse Google Group
  - Dataverse Community Calls
  - Dataverse Community Meeting
  - Workshops & Trainings
  - UI/UX Testing & Interviews
  - Global Dataverse Community Consortium

The Dataverse Cup 🏆

Community Development

Dataverse Ecosystem



Core - Contributing Code to the Dataverse Repo

- Let’s talk early and often!
  - Preview vs Review
- We like small batches, but we’ll follow your lead
- References
  - Developer’s Guide
  - Style Guide
  - API Guide

SPIs / APIs - Why Modularity Matters

- Dataverse is a big application that serves many disciplines with various different needs
  - Almost no-one uses the full functionality
- Modular design allows:
  - Easier code contributions
  - Tailoring installations to institution needs
  - Smaller, more efficient, core
- SPIs - Dataverse calling custom code
- APIs - custom code calling Dataverse

Example Collaborations (Core)

- SBGrid Data
  - Large Data and Support
- Massachusetts Open Cloud
  - Big Data Storage and Compute Access (OpenStack)
- Provenance
  - W3C PROV
- Australian Data Archive (ADA)
  - Use Guestbook for Request Access

Example Collaborations (SPIs)

- SBGrid Data
  - Pre Publish Workflows
- DANS/CIMMYT/GESIS
  - Handles
  - da|ra

Example Collaborations (APIs)

- File Access APIs (External Tools)
  - Harvard SEAS - TwoRavens
  - Scholars Portal - Data Explorer, Data Curation Tool
  - QDR - File Previewers for pdfs, images, videos
- Deposit APIs
  - Open Journal Systems - OJS Plugin
- Client Libraries
  - ResearchSpace - Java
  - AUSSDA - python - pyDataverse

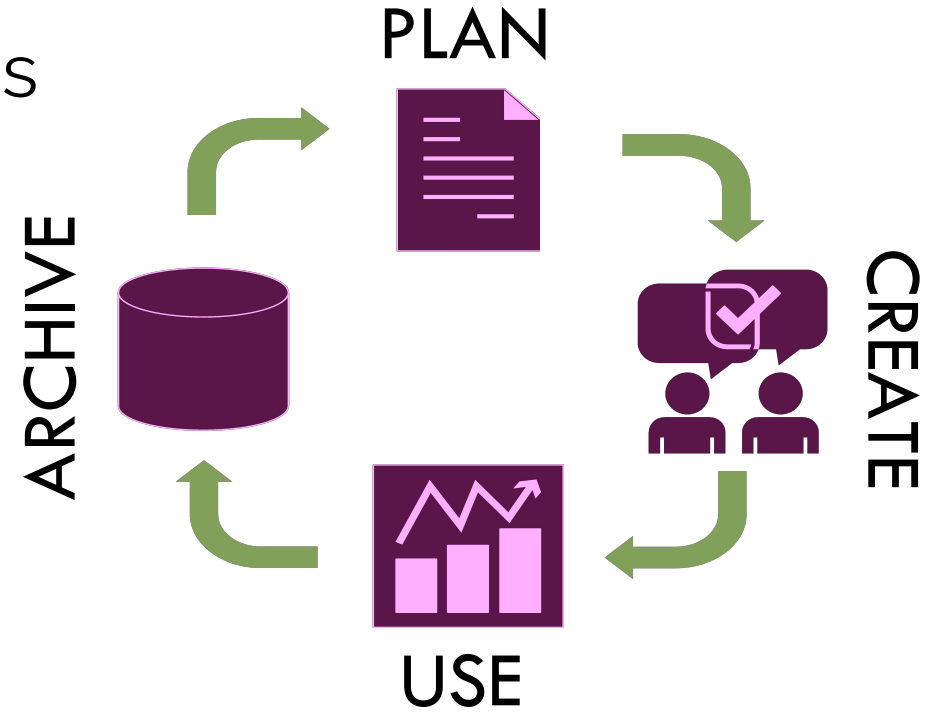
Odum Institute

Who we are: The Odum Institute

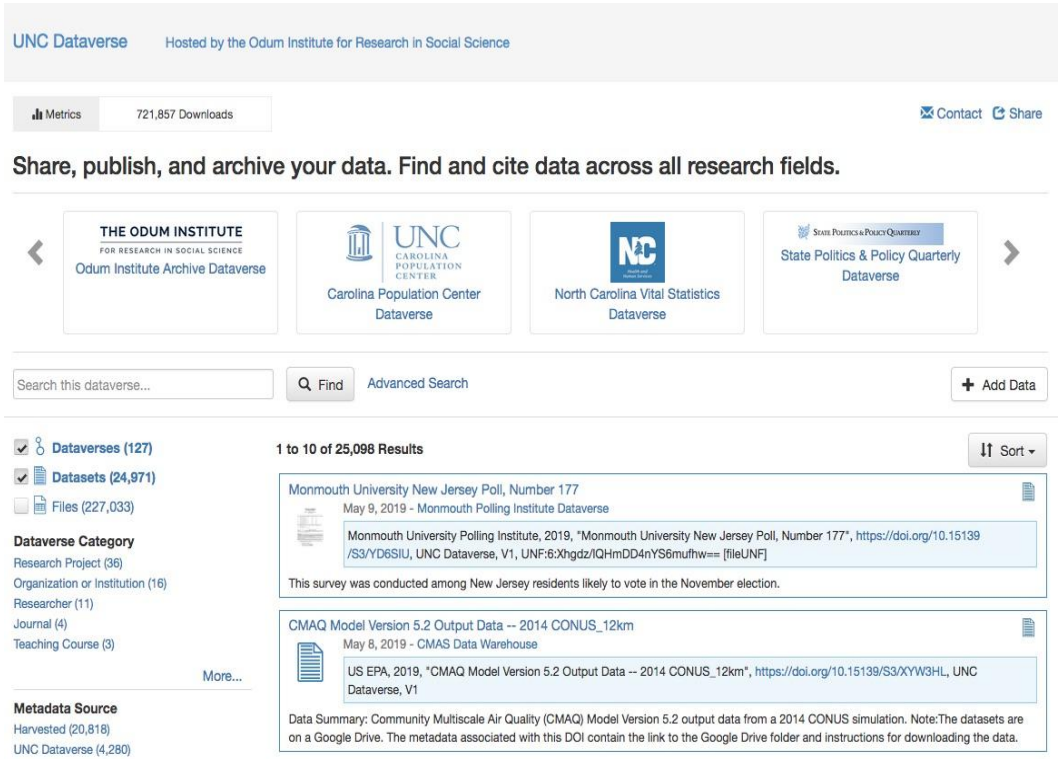
- Founded in 1924 by Howard W. Odum
- Oldest university-based interdisciplinary social science research institute in the U.S.
- *Celebrating 95 years of service*
- *Our mission is to rigorously uphold the highest standards of scientific research across the University of North Carolina and the world, while simultaneously simplifying the research process for researchers we work with.*

Our Services:
Across The Research Lifecycle

- Data Management Plans
- Data Collection
- Data Analysis
- Training & Education
- Consultations
- Facilities & Labs
- Cyberinfrastructure
- Data Archive



UNC Dataverse

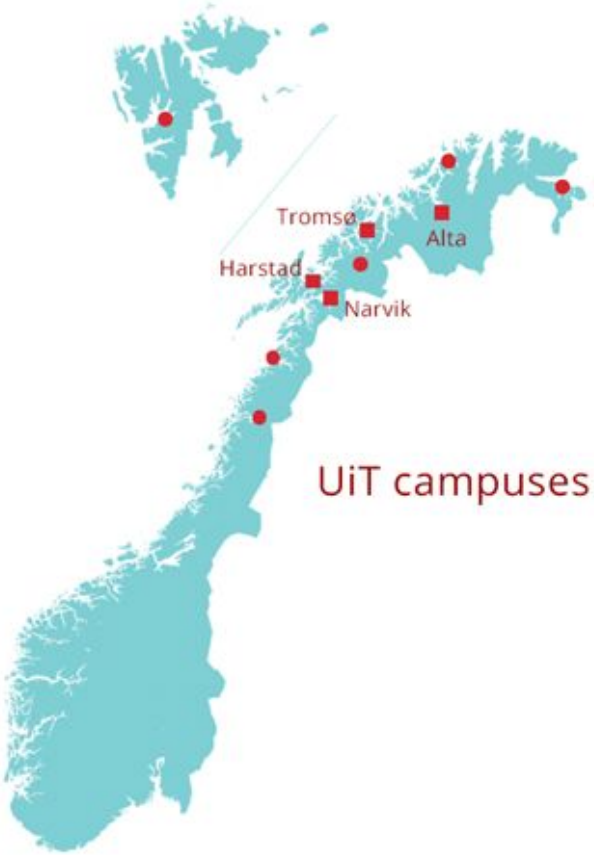


DataverseNO

What is DataverseNO?

- A **national, generic repository** for open research data
- For researchers from **Norwegian research institutions**
- Some collections within DataverseNO also accept data from researchers from other institutions.
- Aligned with the **FAIR** Guiding Principles for scientific data management and stewardship
- Owned and operated by UiT The Arctic University of Norway (https://en.uit.no/)
- **Repository:** dataverse.no | **Info:** info.dataverse.no

Who is UiT The Arctic University of Norway?



- Northernmost university in the world
- Established in 1968
- 6 campuses
- 8 faculties covering all major disciplines
- 3 511 employees (FTE)
  - 2 191 faculty
- 16 747 students
  - 118 PhD students per year
- 254 study programs
  - 90 Master's degree programs (30 international)
  - 7 PhD programs

How does DataverseNO work?

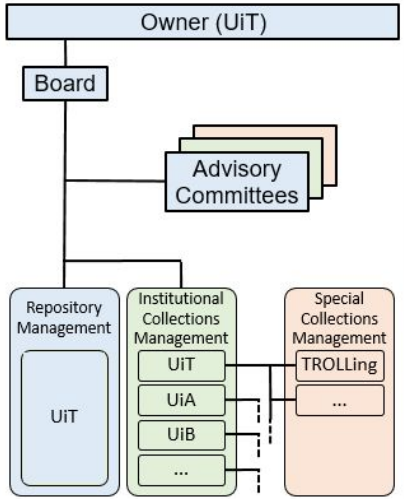
- **8 partner institutions**, all of them **Norwegian universities**
- Each partner institution has its own **institutional collection**
- **All data** is **curated** by research data support staff at partner institutions
- **Common policies and guidelines** apply for the entire repository (info.dataverse.no)
- Applied for **CoreTrustSeal** certification

Organization of DataverseNO

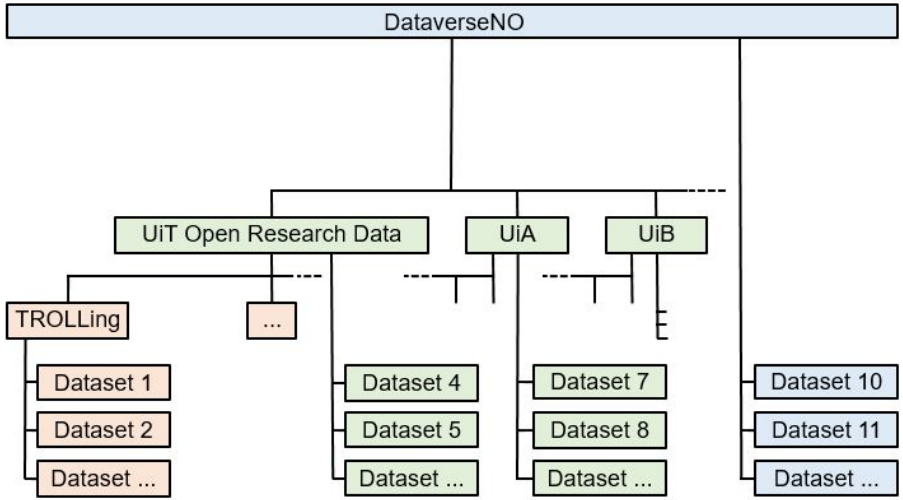
ORGANIZATIONAL DOCUMENTS

- DataverseNO Policy Framework
- DataverseNO Steering Documents
- DataverseNO Administrator Guidelines
- DataverseNO Curator Guidelines
- DataverseNO Deposit Guidelines
- ...

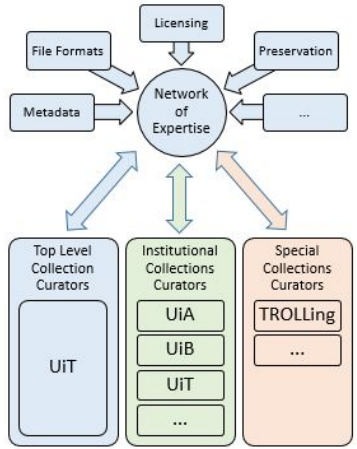
GOVERNANCE



REPOSITORY STRUCTURE



DATA CURATION



DESIGNATED COMMUNITY

- Researchers within User Groups of Special Collections
  - Linguists
  - ...
- Researchers from Partner Institutions in Norway
  - HVL
  - INN
  - NMBU
  - NORD
  - NTNU
  - UiA
  - UiB
  - UiT
  - ...
- Researchers from Non-Partner Institutions in Norway

Join us at the European Dataverse Workshop 2020!


Photo: Frank Olsen, Norway (CC BY SA 3.0)

- **Venue:** UiT, Tromsø
- **Date:** January 23-24, 2020 --- during the Northern Lights season!

- More info on the workshop homepage:

https://tinyurl.com/dataverse2020

Dataverse in EU

SSHOC is EU Social Sciences and Humanities Open Cloud

- DANS-KNAW (Netherlands) established Dataverse as a service for Dutch Universities in May, 2014.
- The goal of SSHOC Dataverse project (CESSDA, DARIAH and CLARIN) is to create a reliable and production ready Open Source data infrastructure that everybody can install and reuse for their own needs and requirements.
- We’re developing multilingual web interface and localizing metadata fields and developed data standardization technique based on APIs for CESSDA CVs, Topic Classification and CESSDA CV Manager services.

SSHOC
social sciences & humanities open cloud

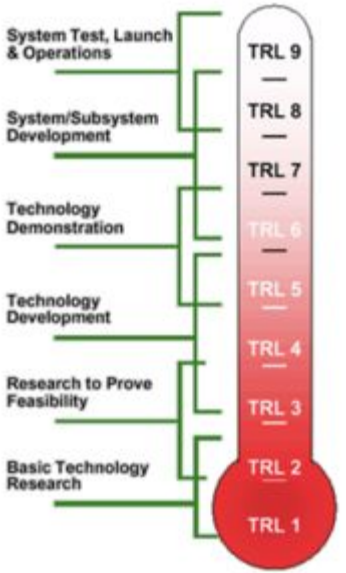
Data Archiving and Networked Services
DANS

Production ready Dataverse infrastructure

- reliable and scalable Cloud service that can be deployed in Kubernetes
- out of the box installation on Google Cloud, Amazon AWS and Microsoft Azure
- can be connected to any research infrastructure by APIs
- distributed multilingual data infrastructure consisting of connected Dataverse nodes and forming a federated data portal
- repository already integrated with data previewers, external applications and VREs
- external controlled vocabulary support is the interoperability solution

Services in European Open Science Cloud (EOSC)

- EOSC requires the level 8 of maturity (at least)
- we need the highest quality of software to be accepted as a service
- clear and transparent evaluation of services is essential
- the evidence of technical maturity is the key to success
- the limited warranty will allow to stop out-of-warranty services



Dataverse App Store

Let’s build different services out of tools!

Data preview: DDI Explorer, Spreadsheet/CSV, PDF, Text files, HTML, Images, video render, audio, JSON, GeoJSON/Shapefiles/Map, XML

Interoperability: external controlled vocabularies (CESSDA CV Manager)

Data processing: NESSTAR DDI migration tool

Linked Data: RDF compliance including SPARQL endpoint

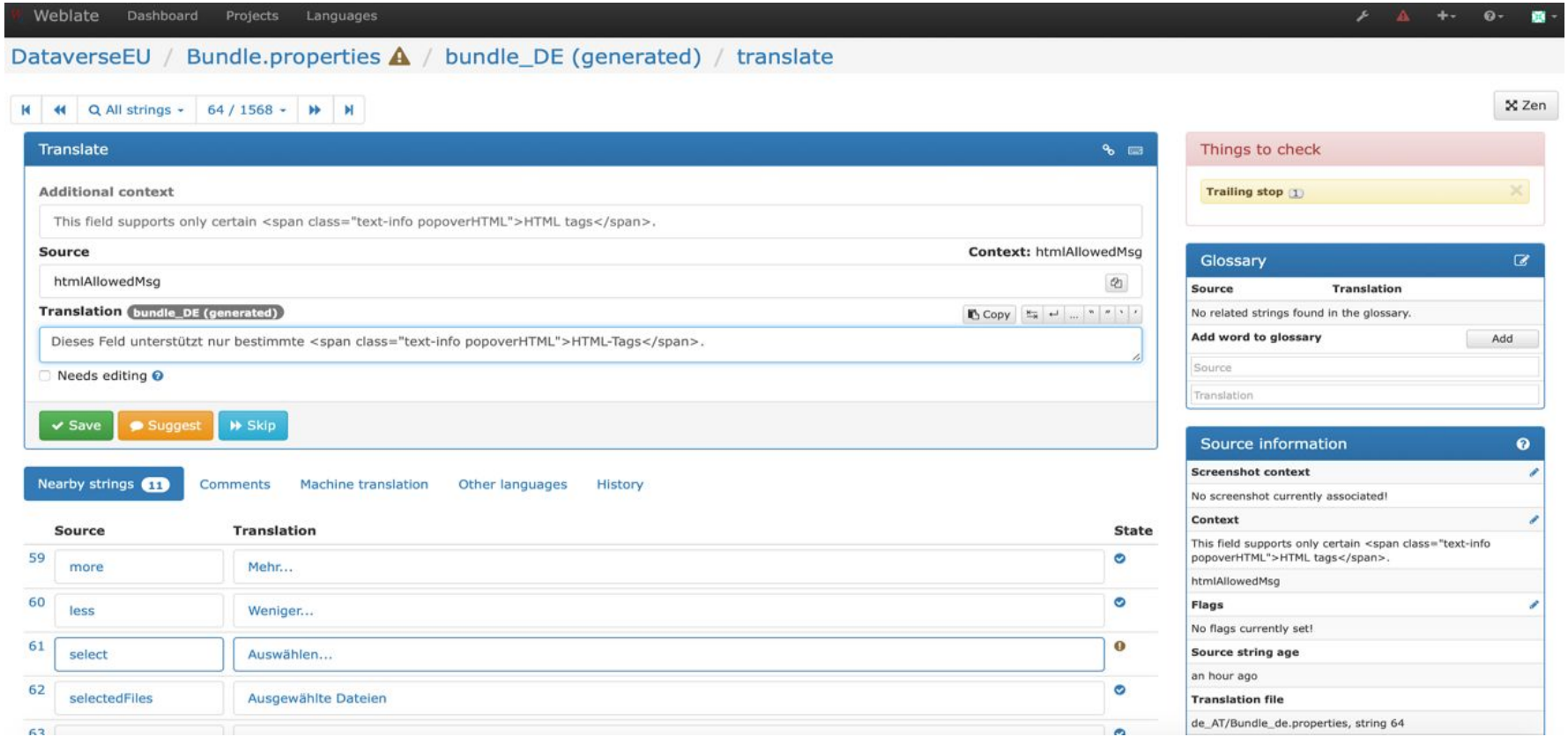
Federated login as a service (OAuth/Shibboleth in the same installation)

Multilingual support

DataverseEUwill run Weblate as a service for the user interface, metadata schema and SOLR translation.

We’re developing an experimental but adjustable pipeline for multilingual support that allows to download and synchronize all translations available in Dataverse Consortium github and provides easy access for translators to keep all properties up-to-date.

Weblate as a Dataverse service



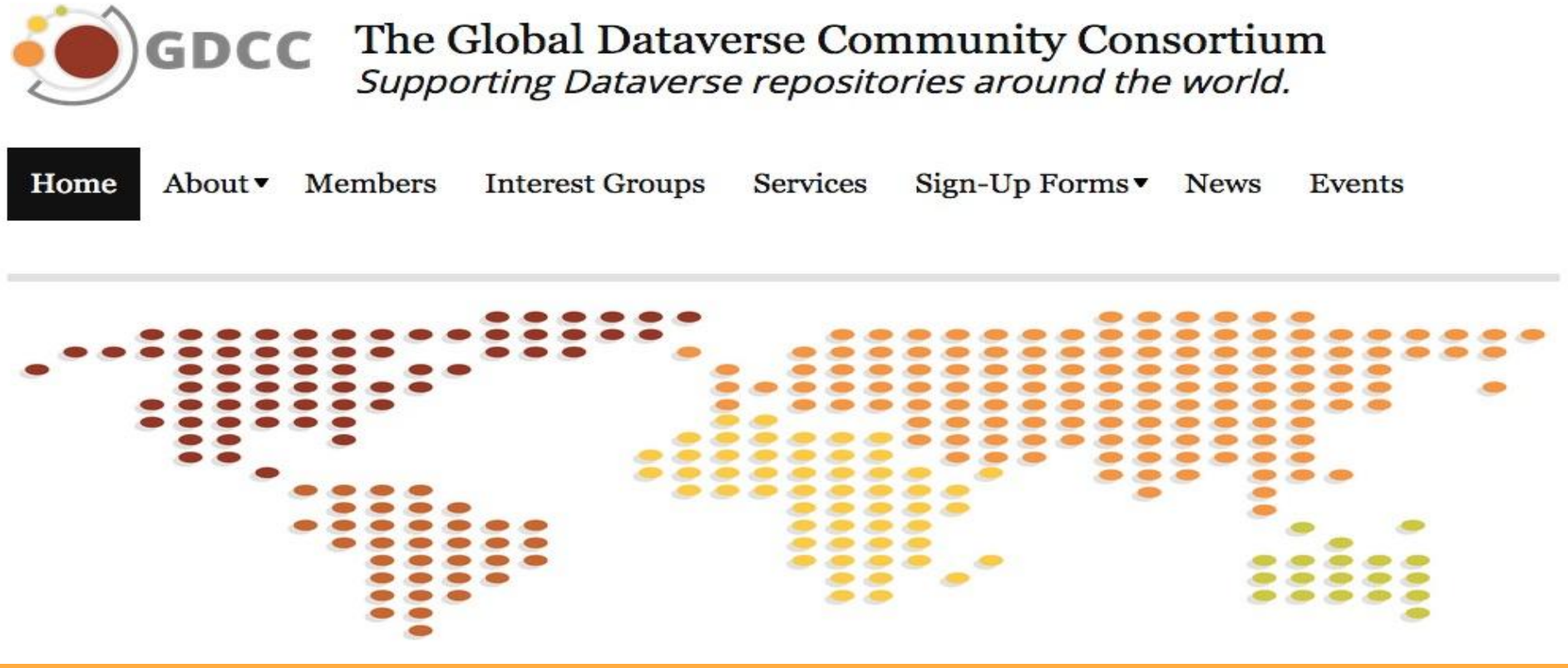
Global Dataverse Community Consortium

Global Dataverse Community Consortium

- Supporting Dataverse repositories around the world

The Global Dataverse Community Consortium (GDCC) is dedicated to providing international organization to existing Dataverse community efforts, and will provide a collaborative venue for institutions to leverage economies of scale in support of Dataverse repositories around the world.

http://DataverseCommunity.Global

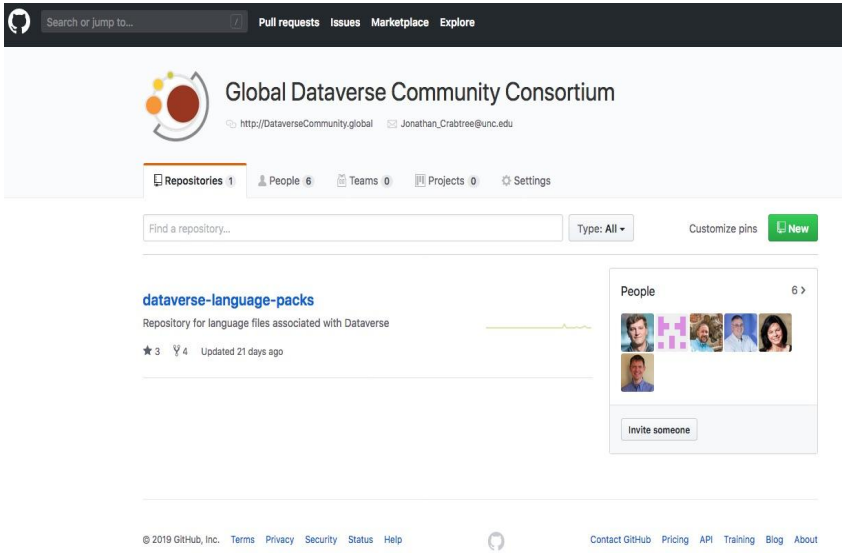


Global Dataverse Community Consortium

Australian Data Archive	Australia
Consorcio Madrono	Spain
DANS	Netherlands
DataverseNO	Norway
Fudan University	China
Gottingen eResearch Alliance	Germany
Harvard University	United States
International Centre for Research in Agroforestry	Kenya
Johns Hopkins University	United States
Nanyang Technological University	Singapore
Syracuse University	United States
Texas Digital Library	United States
University of California Los Angeles	United States
University of Campinas	Brazil
University of North Carolina Chapel Hill	United States
University of Virginia	United States

Membership Expanding

Initial Services



New Potential Services?

Collaborative Code Development

Shared Programming Staff

Joint Documentation Initiative

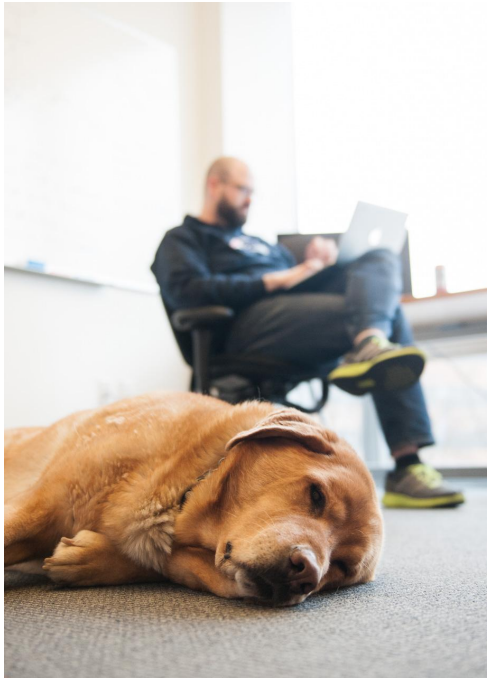
Collaborative Code Testing

Joint Funding Applications

Shared Community Policies

?????????

Thank you!



The Dataverse® Project

Open source research data repository software

Researchers

Enjoy full control over your data. Receive *web visibility, academic credit,* and *increased citation counts.* A personal dataverse is easy to set up, allows you to display your data on your personal website, can be branded uniquely as your research program, makes your data more discoverable to the research community, and satisfies data management plans. Want to set up your personal dataverse?

Journals

Seamlessly manage the submission, review, and publication of data associated with published articles. Establish an *unbreakable link* between *articles in your journal* and *associated data.* Participate in the open data movement by using Dataverse as part of your journal data policy or list of repository recommendations. Want to find out more about journal dataverses?

Institutions

Establish a research data management solution for your community. Federate with a growing list of Dataverse repositories worldwide for increased discoverability of your community's data. Participate in the drive to set norms for sharing, preserving, citing, exploring, and analyzing research data. Want to install a Dataverse repository?

Developers

Participate in a vibrant and growing community that is helping to drive the norms for sharing, preserving, citing, exploring, and analyzing research data. Contribute code extensions, documentation, testing, and/or standards. *Integrate research analysis, visualization* and *exploration tools,* or other research and data archival systems with Dataverse. Want to contribute?

https://dataverse.org
https://github.com/iqss/dataverse