Open-Source Online Platform for UAS HTP Data Management

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OVERVIEW

- How can we better manage large volumes of UAS HTP data collected in the field?
- Building an open-source platform for managing, collaborating, and visualizing spatial data
- Demonstration of current development site

PROJECT BACKGROUND

MOTIVATION

- Researchers today are capturing large volumes of UAS HTP at a high spatial and temporal resolution
- Research can be impeded when we don’t know what data we have and how to access it
- How can we store, process, visualize, and collaborate findings with other researchers across disciplines?

OBJECTIVE

- Build an **open-source** online platform that research groups can use as a one-stop shop to:
  - Upload, storage, and organize UAS data
  - Process and visualize the data with interactive tools
  - Collaborate with other researchers
  - Publish findings to a public central catalog

MAJOR PLATFORM COMPONENTS

Application Instance

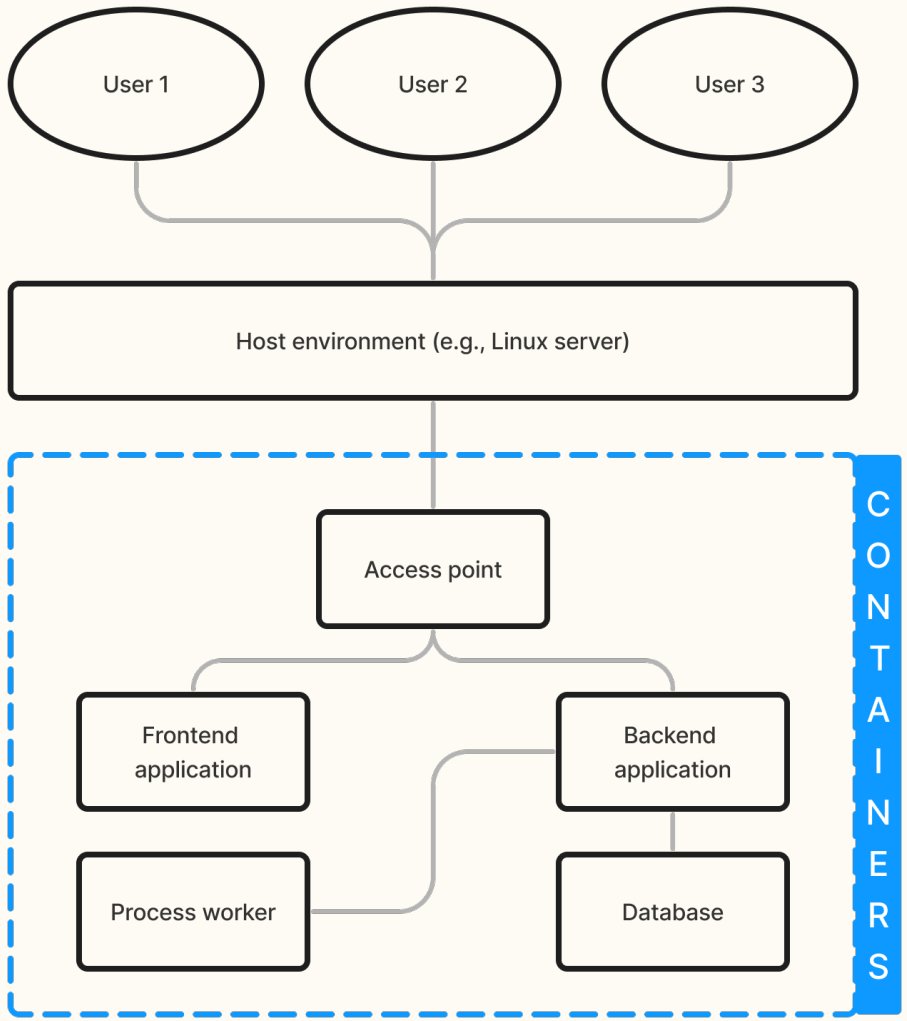
- Containerized full stack web application
  - Frontend framework
  - Backend framework
  - Database
  - Web server
- Open-source and self-hosted

Public Central Catalog

- Queryable catalog of published assets from application instances

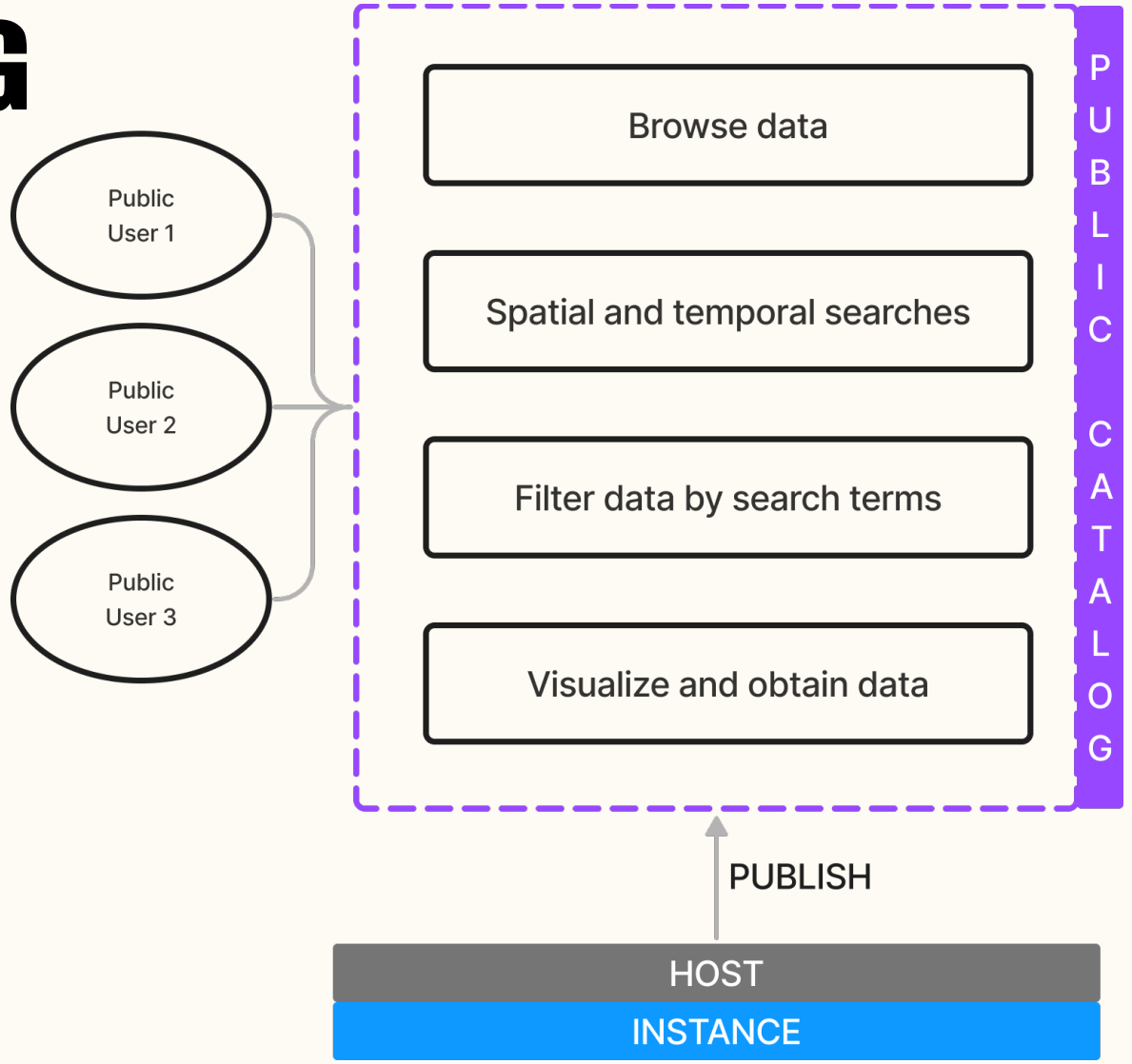
APPLICATION INSTANCE

- Can be hosted from environments that support Docker
- Each instance consists of multiple containers with a single access point
- User data remains under host's control



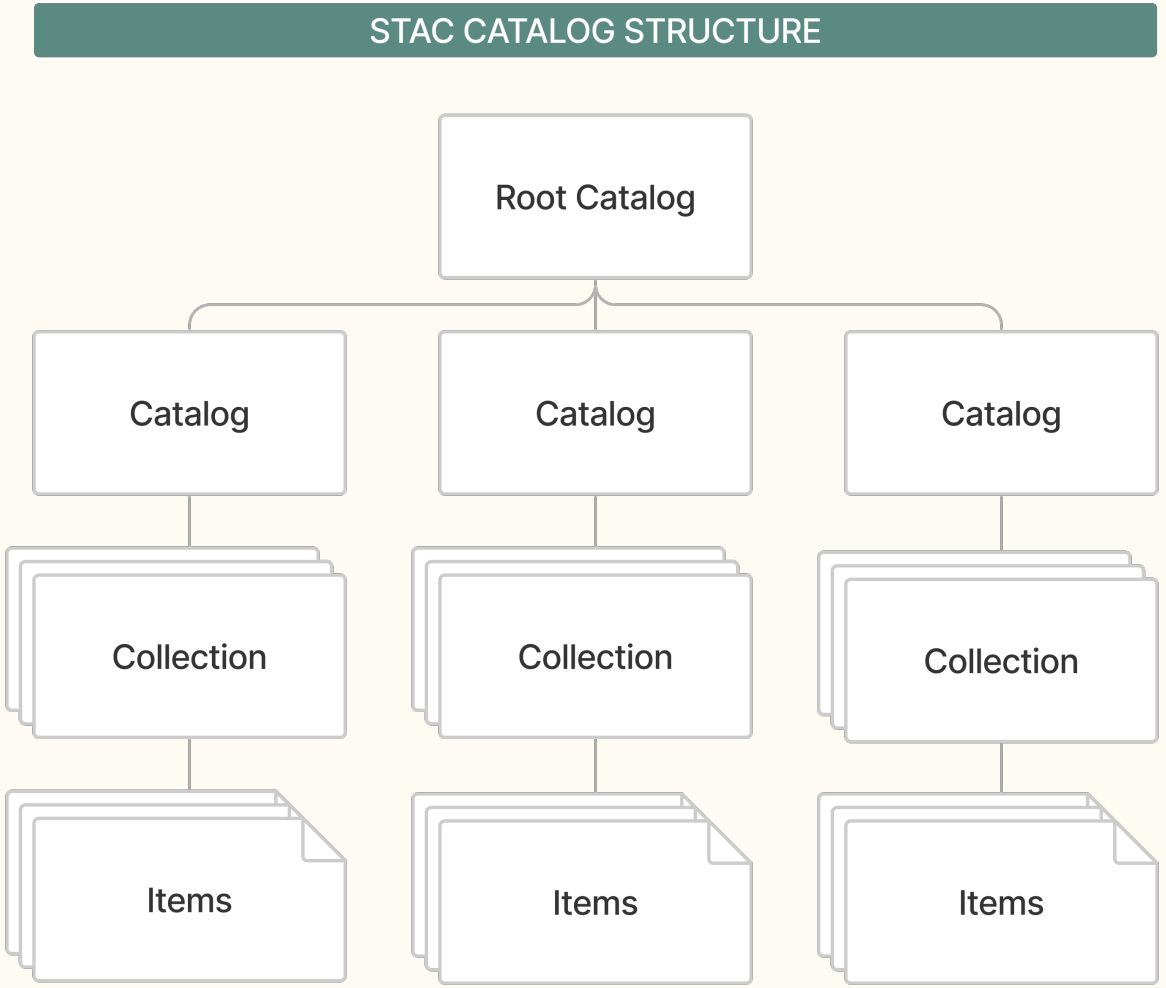
PUBLIC CENTRAL CATALOG

- Researchers can publish data from an application instance to an open public catalog
- Only metadata and URL to dataset published
- Physical dataset will remain with application instance host



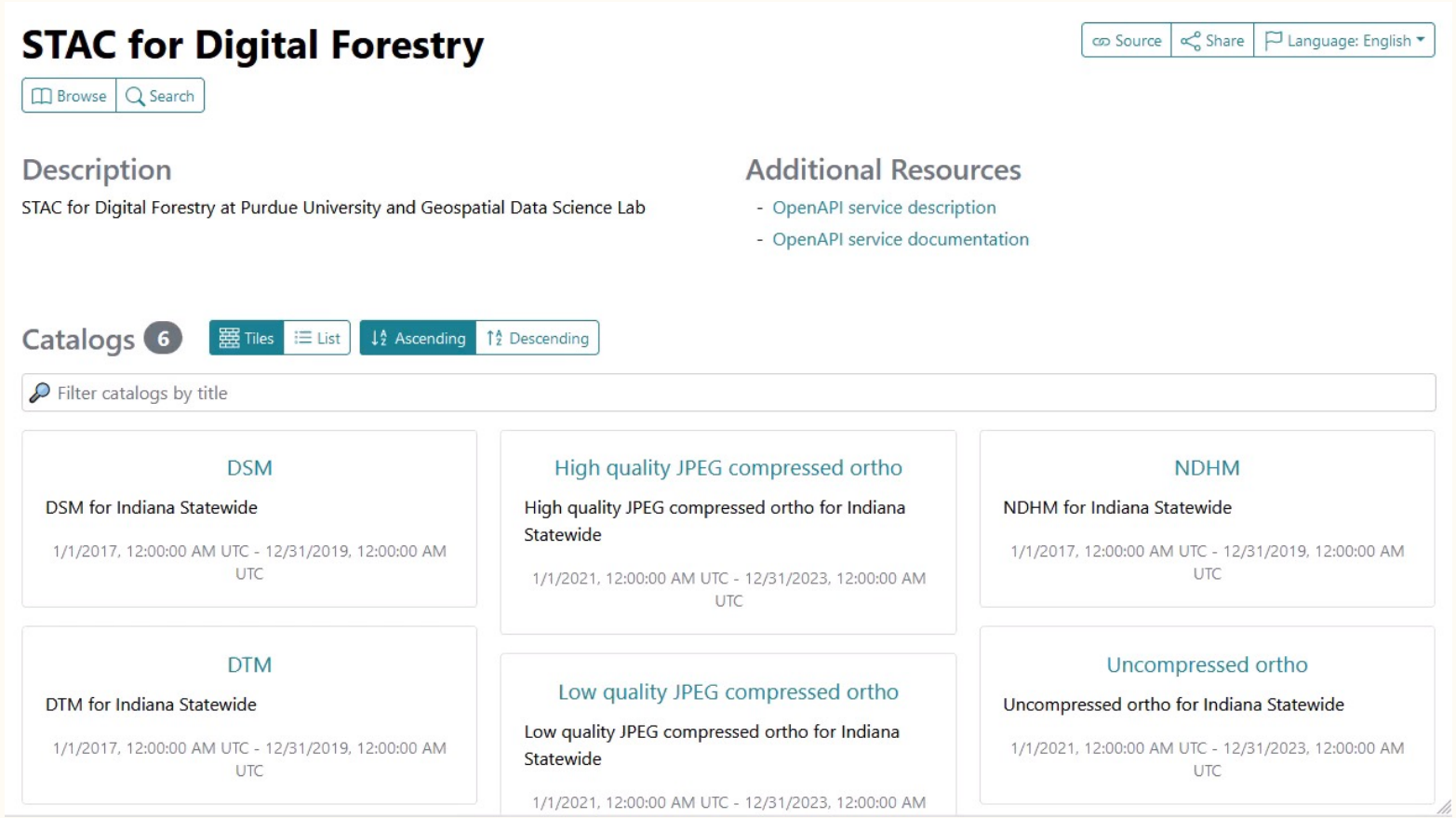
STAC

- Centralized catalog built to **S**patio**T**emporal **A**sset **C**atalog (STAC) specification
- Three primary data models: Catalog, Collection, and Item
- Involved community, large collection of tools and extensions



EXAMPLE STAC

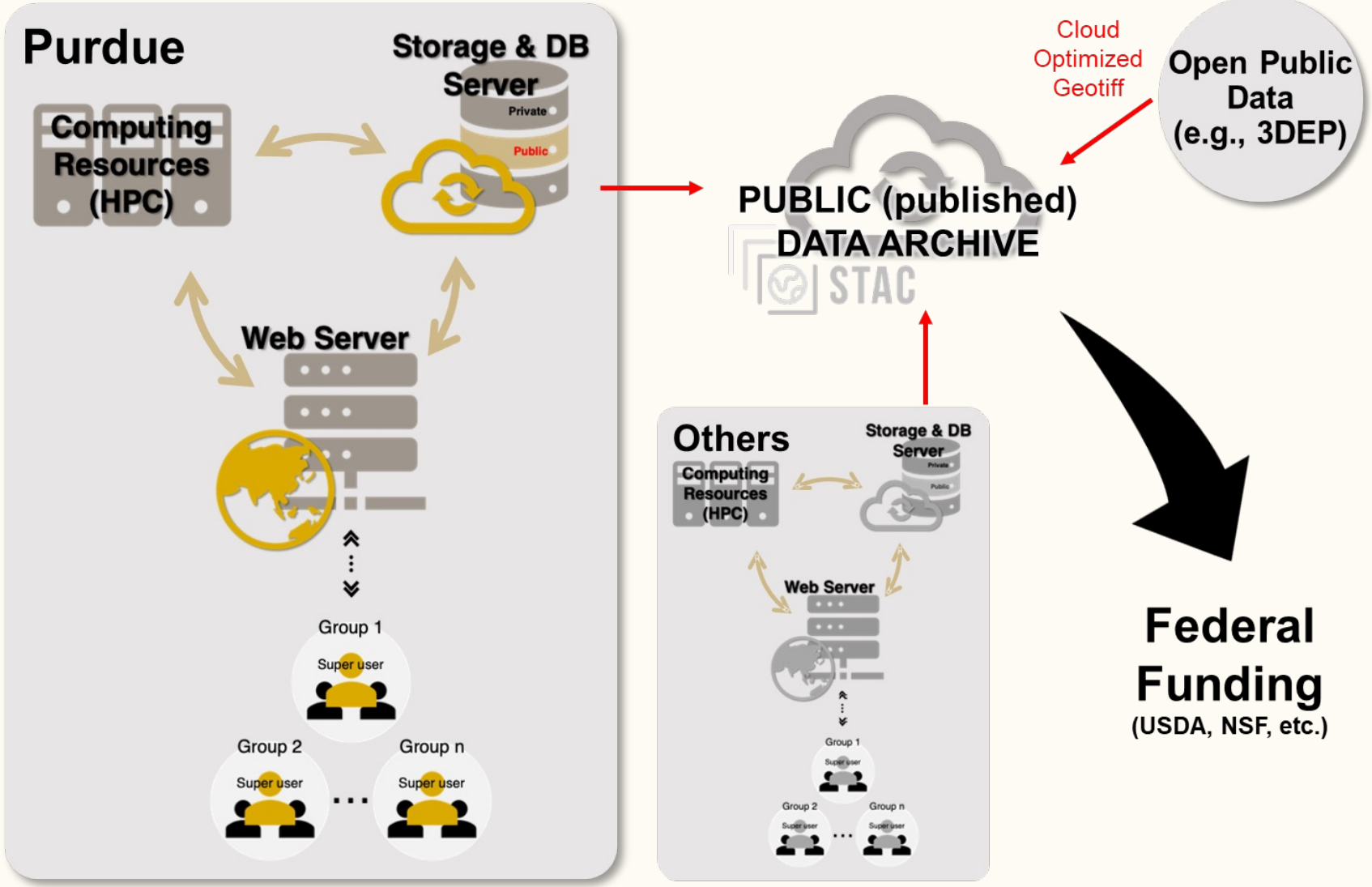
- STAC for Digital Forestry
  - Indiana LiDAR and ortho datasets
  - Accessible through STAC Browser and backed by STAC API
  - Spatial and temporal queries supported



GOAL

"To make UAS HTP data FAIR and an online platform SCALABLE"

Findable | Accessible | Interoperable | Reusable



DEVELOPMENT PROGRESS

On the path to version 0.1

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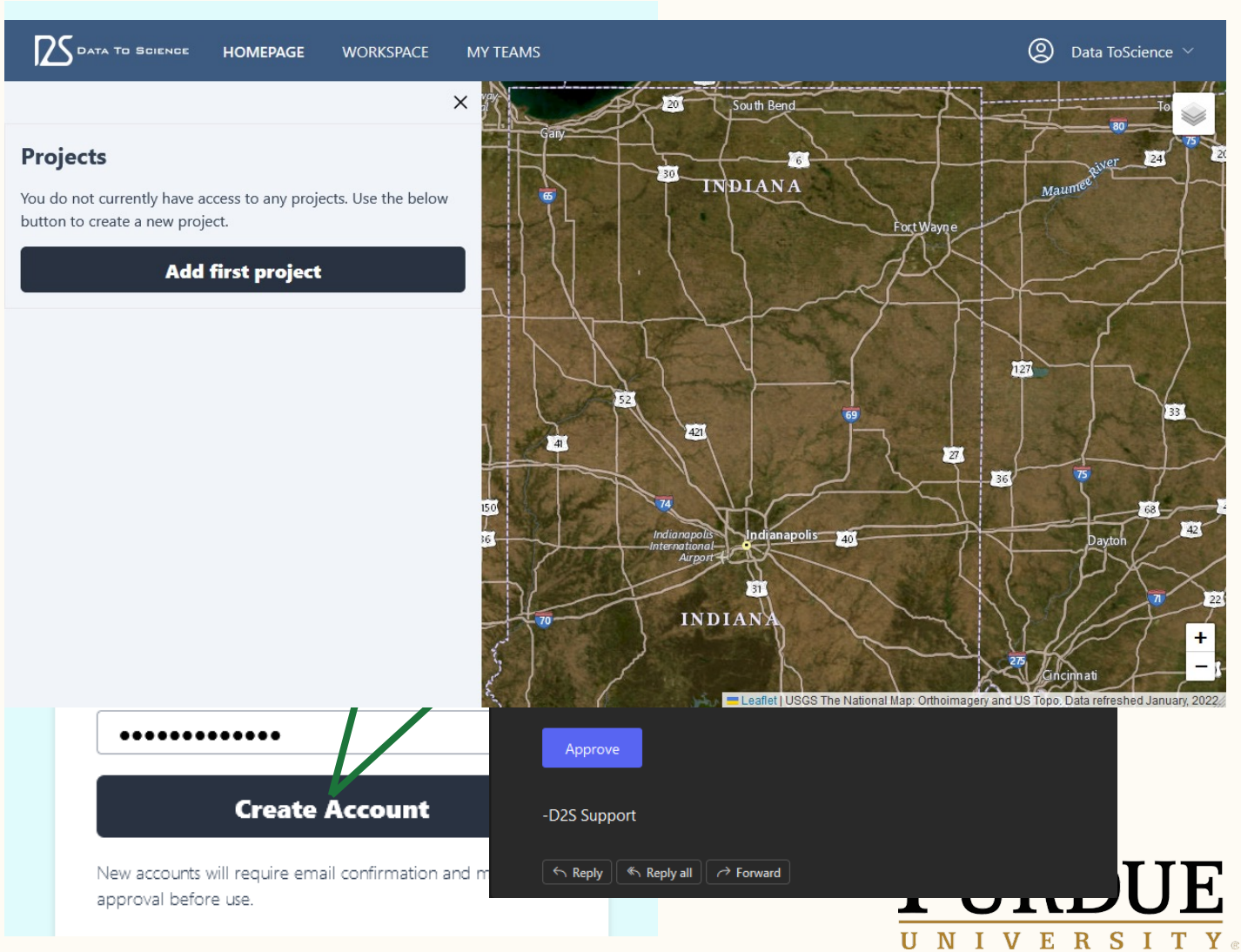
ACCOUNT MANAGEMENT

- Account registration with email confirmation
- Email alerts sent to application instance admins
- Password recovery



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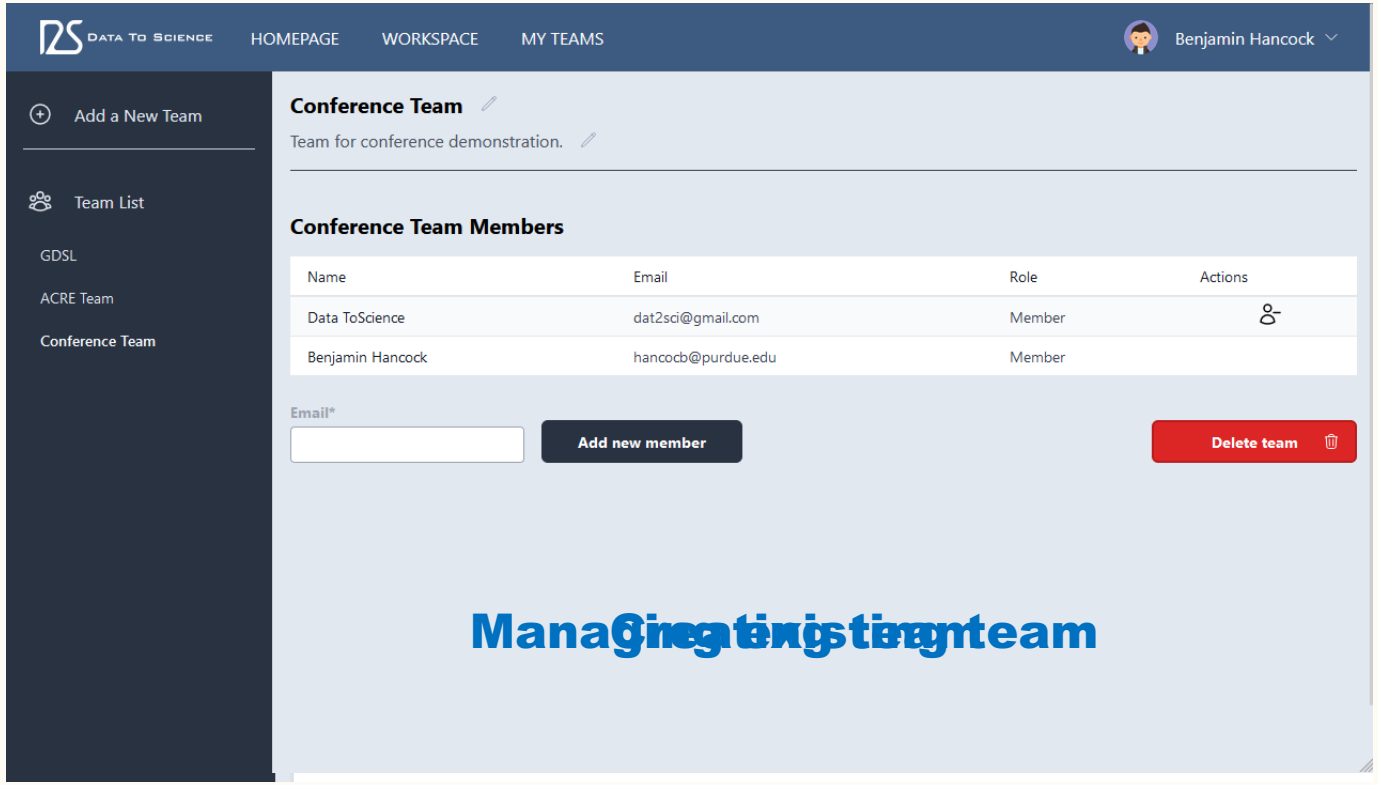
TEAMS

- Create or join existing team
- Team members gain access to a team's project data
- Only team owner can add and remove members, and delete the team



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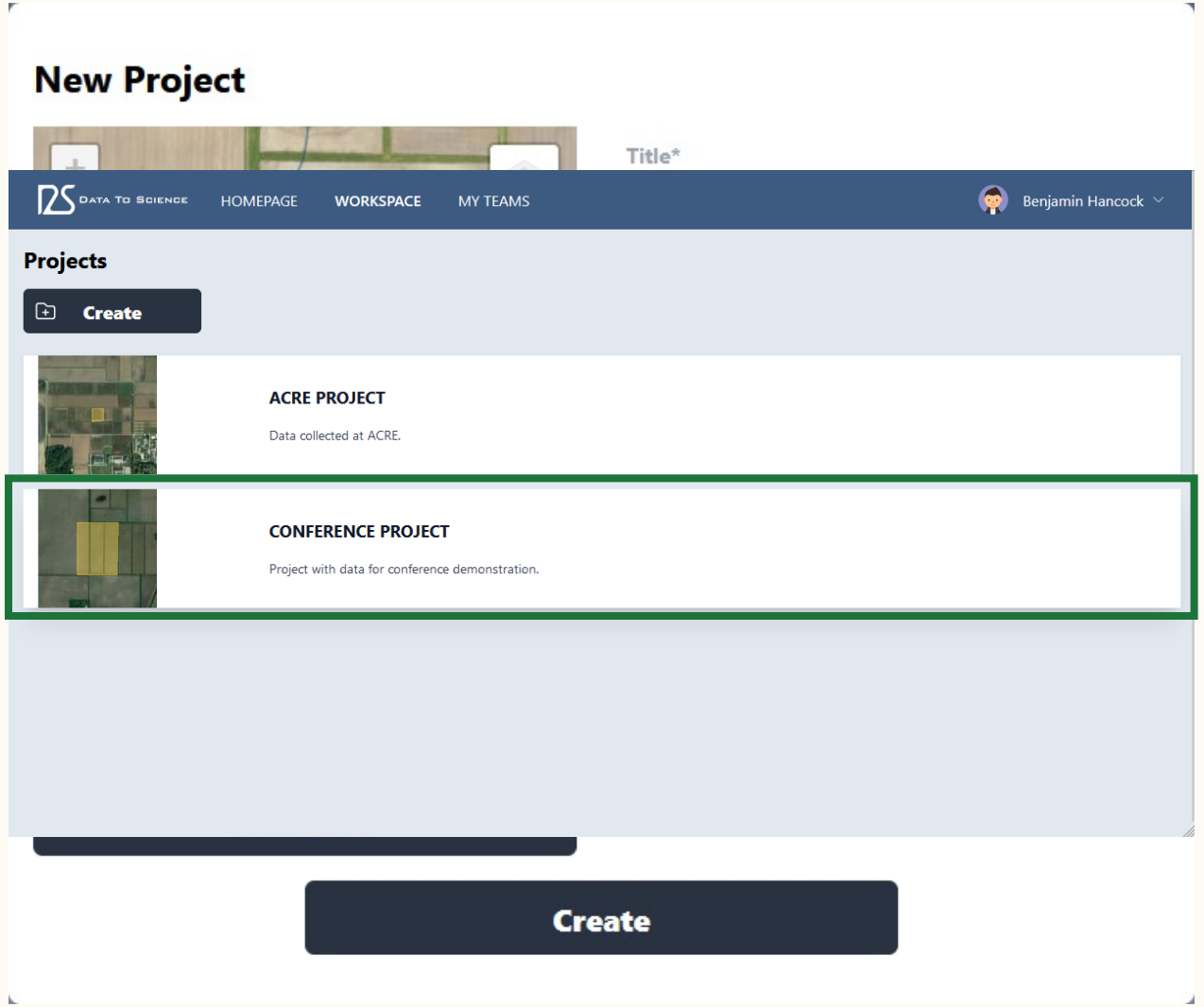
PROJECTS

- Anyone can create a project
- Projects can be associated with an existing team
- Must provide title, description, and field boundary

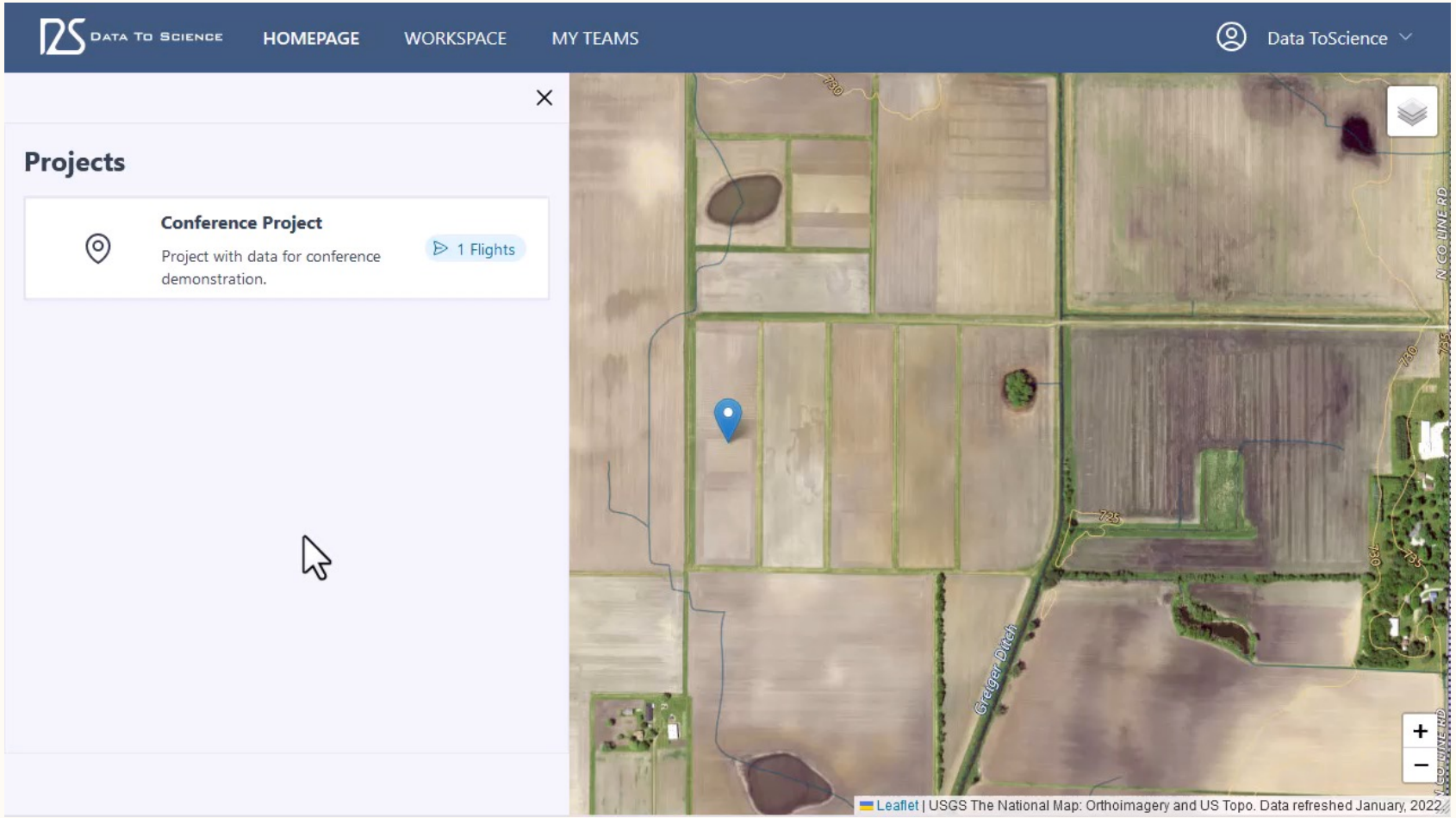


FLIGHTS

- Multiple flights can be added to a single project
- Upload raw data and data products
  - Ortho GeoTIFF
  - DSM GeoTIFF
  - Point Cloud
  - Other

VISUALIZING PROJECT DATA

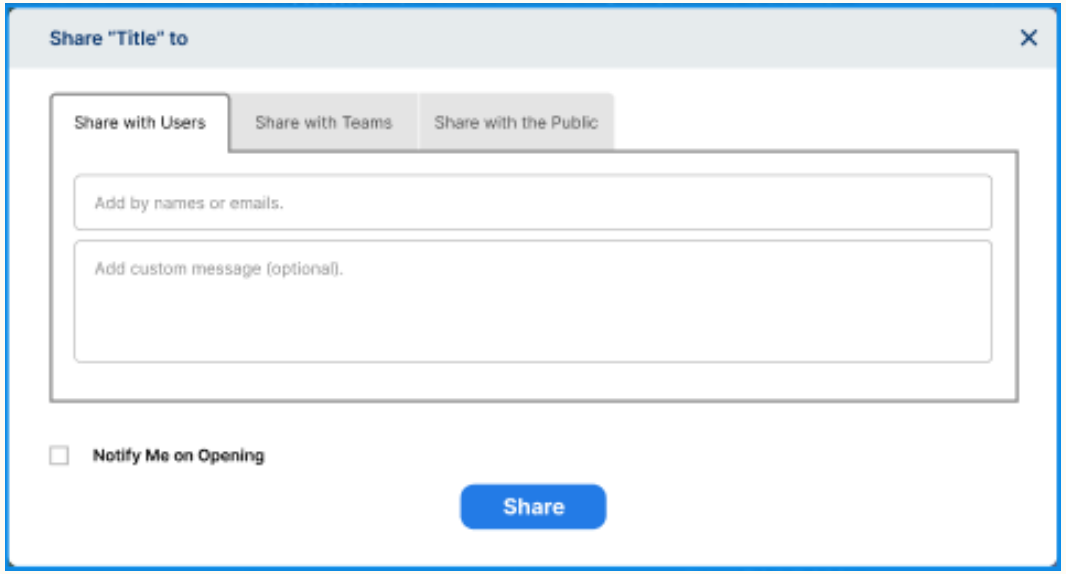
- Projects listed in left pane
- GeoTIFFs streamed in COG format
- User specific symbology props



SHARING MAPS

- Team members have access to the same data products, but not the same symbology settings

- Share specific symbology settings for a data product with other users



- Share visualization with non-account holders

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- Purdue Plant Science 2.0 Initiative

- Purdue Digital Forestry

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THANK YOU

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