USDA
United States Department of Agriculture

Data Basin Playbook

November 2019

R8 – Resource Information Management
Chelsea Leitz
chelsea.leitz@usda.gov

Forest Service

Table of Contents

Introduction

Purpose & Need

"A steady increase in collaboration capacity and recent breakthroughs in Forest Service science, mapping, and technology are providing new tools for planning investments to reduce fire risk and improve forest conditions. The USDA Forest Services wants to implement these new authorities and advances in technology by working with States to set priorities and co-manage risk across broad landscapes.

Through shared stewardship, the Forest Service and State and other partners have opportunities to co-manage risk for desired outcomes at the most appropriate scales. Goals include determining management needs on a State Level, thinking beyond our administrative boundaries and setting priorities together, and combining our mutual skills and assets to achieve outcomes with the highest ecological value. We want to do the right work in the right places at the right scale..." This is accomplished "through mapping and decision tools to locate treatments where they can do the most good, thereby protecting communities, watersheds, and economies where the risks are greatest." *(https://www.fs.fed.us/managing-land/shared-stewardship)*

The Southern Region is exploring a platform to share data efficiently with our state and private partners to prioritize the restoration work that will yield the greatest returns and the most resilient landscape. Better sharing of data, planning, implementation, monitoring, and communications will support integrated decision making with all partners.

Scope

Data Basin is a "science-based mapping and analysis platform that supports learning, research and sustainable environmental stewardship." Using this platform, the National Forest of North Carolina is testing a pilot project to share data with partners to better plan, implement, and communicate about their future goals and integrated work. All invited users will have access to a collaborative group in order to share their data for a cohesive digital map product to inform better decision making.

This document will provide guidance for users seeking to create an account, join collaborative groups, publish content, and more. The document will describe user roles and permissions and how to manage quality content. There will be examples and instructions for using analysis tools, visualizations, and drawings.

Environment

Data Basin was built by the Conservation Biology Institute (CBI) in 2010. Their goals are to integrate science, people, policy and practice with access to spatial data. "The core of Data Basin is free and provides open access to thousands of scientifically-grounded, biological, physical, and socio-economic datasets." The goal is to reach a broad audience for collaboration and negotiation. Data Basin has a support team available for comments, questions and concerns as well as sample maps, glossary, and pre-recorded video tutorials.

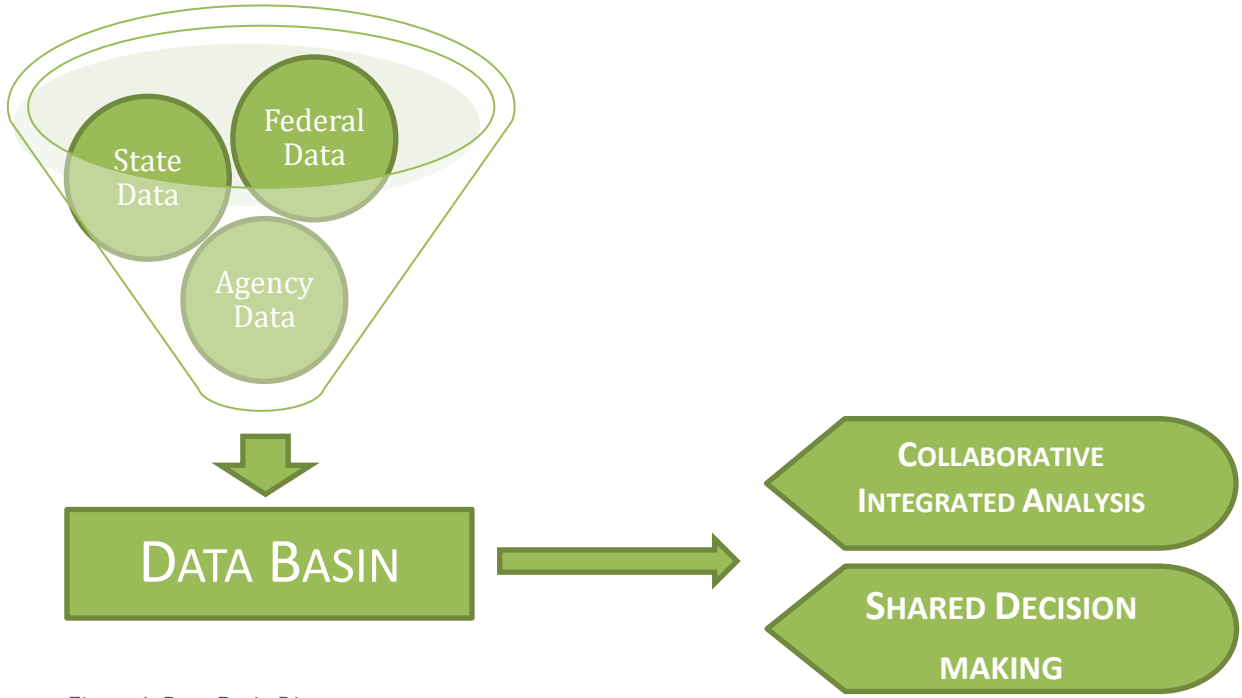


Figure 1: Data Basin Diagram

Getting started

Sign Up & Login

To gain access to Data Basin to sign in/login, click here https://databasin.org/
The top of the website provides options to Sign up or Sign in. If this is your first time, click 'Sign up'. Note, there have been issues with the security verification on USFS computers while using Internet Explorer, if this occurs, use Google Chrome.

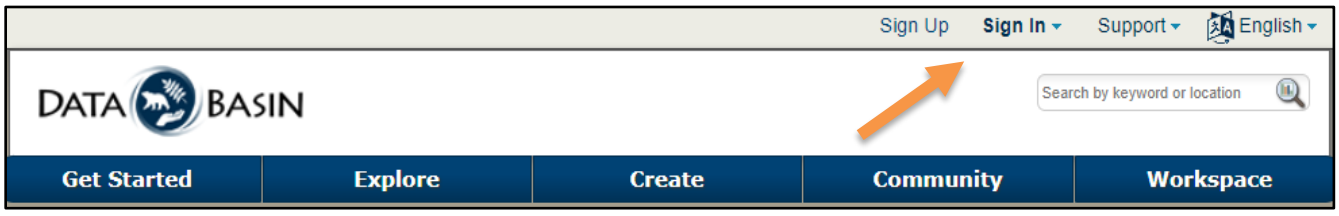


Figure 2: Signing up for Data Basin

Username

It is recommended to use your email short name and your affiliation when creating an account for simple identification purposes. For example, use your short name (email name) underscore your affiliation: smokeybear_usfs. jane.doe_fws, jdoe_nwtf, jdoe_wbu, etc.

Workspace

Each individual will have their own workspace. It is the best place to start to visualize and organize your maps, data or groups. Once clicking 'Workspace Home,' you will be directed to any previously created datasets or maps. There will also be recent activity, recently viewed items, and bookmarks.

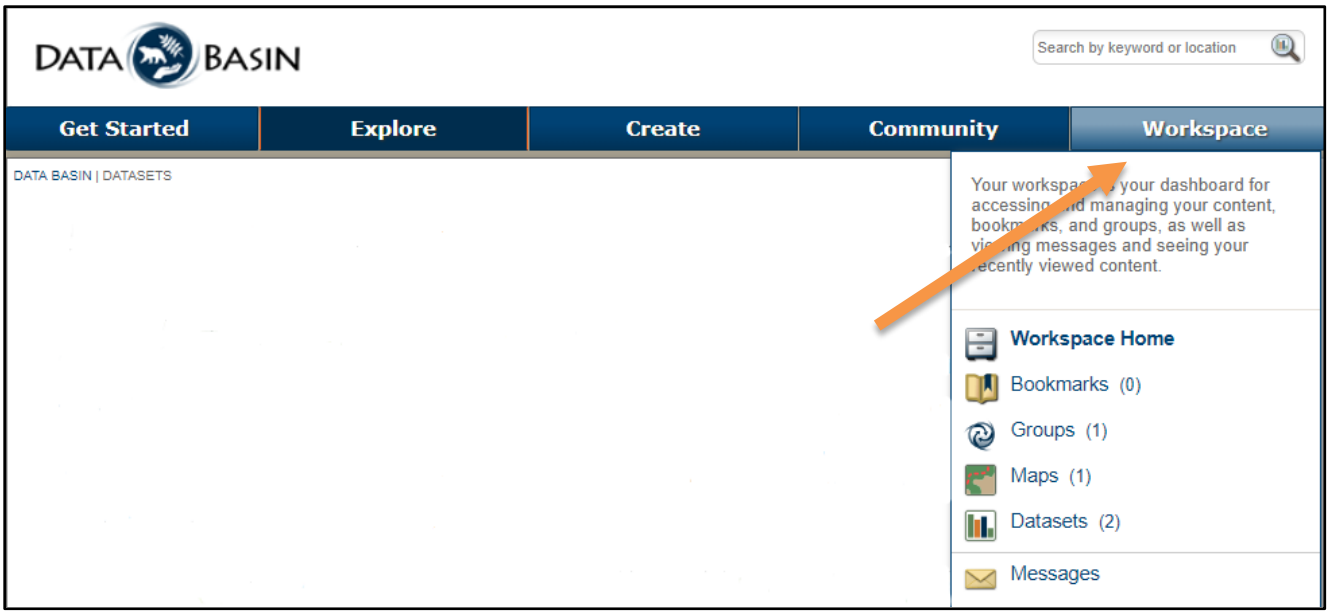


Figure 3: Data Basin Workspace

Permissions

Before importing any data, each user needs to request permission. Click 'Contact Us' at the bottom of the webpage and provide a brief description of the project and you wish to request uploading permissions. Example: "I am participating in the USFS Shared Stewardship effort to support science based strategic decisions using spatial connections with our partners. I need access to upload our datasets." Once submitted, the user should receive email confirmation and granted the appropriate permissions within 2 business days.

Groups

Groups allow for multiple users to share and control access for mutual content. This functionality is one of the most important tools for data collaboration. Groups provide a landing page for all related content with a filing structure of their choosing. Maps & datasets can be added to the group workspace in a public or private setting. Public groups will be searchable within the Search function; however, for private groups, the owner will have to manually add the user to the group.

Group Roles

- Owner - The owner is the data basin member who created the group. Only the owner can delete the group, edit the group text, and control permissions (making it public or private). The owner can organize content, add/remove members, edit the profile, and message all members. Ownership of a group can be transferred from one Data Basin member to another by emailing the Data Basin support team.
- Administrator – This role can be given to multiple members. The Administrator(s) can create new folders, add content or add new group members.
- Member – This role allows a member to view a group workspace content. This role can be given to multiple members.

To create a group, click the 'Create' tab and select 'Create a Group' (such as the picture below).

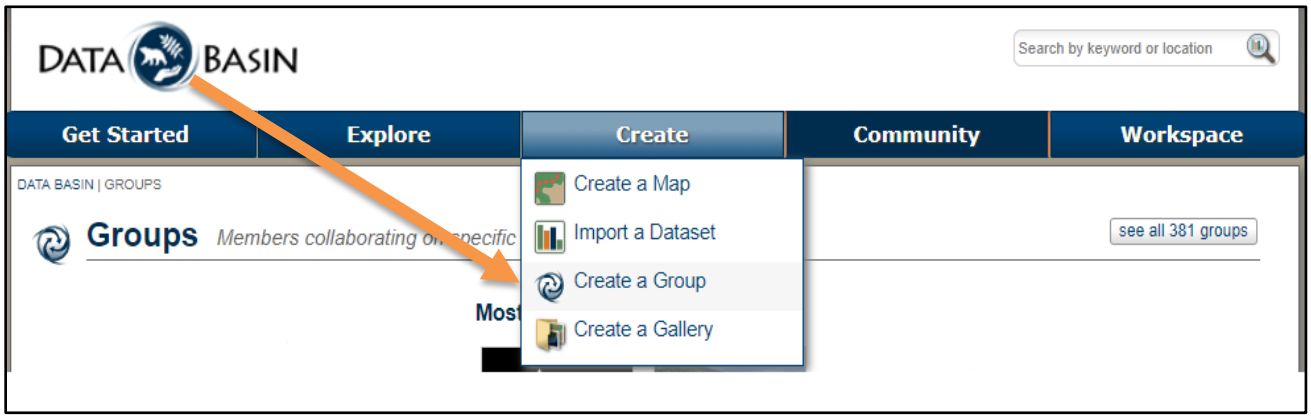


Figure 4: Creating a group in Data Basin. For more information, check out this YouTube video on How to use Groups: https://www.youtube.com/watch?v=uj_uqFunwOA

A group name, description and the option for **public or private is** required to create the group. A **public** group is visible to all users and allows users to request group access. A **private** group is only visible to invited members and each new member must be added manually. See Appendix A for an example of Public Group Page with appropriate descriptions and tags.

Group Description *'Describing the group and its objectives'*
This section should be filled out with information about the group. Explain the purpose, link to reference materials or websites and provide group contact information if needed. This section is especially important for public groups.

Group Tags *'Tags that describe this group'*
This section is required and again helpful for public groups. Most tags are one word descriptors of the content within the group or its associations. For example, North Carolina, conservation, restoration, longleaf pine, usfs, nc state, etc. When searching Data Basin, these tags will help users find your group even if they don't know the exact name.

To join an USFS Shared Stewardship group, please email Chelsea Leitz: chelsea.leitz@usda.gov.

Working in & Organizing Groups

The owner of a group is responsible for organizing content. With a copious amount of data, using a standardized structure for all groups is necessary. The picture below is an example of a possible group structure.

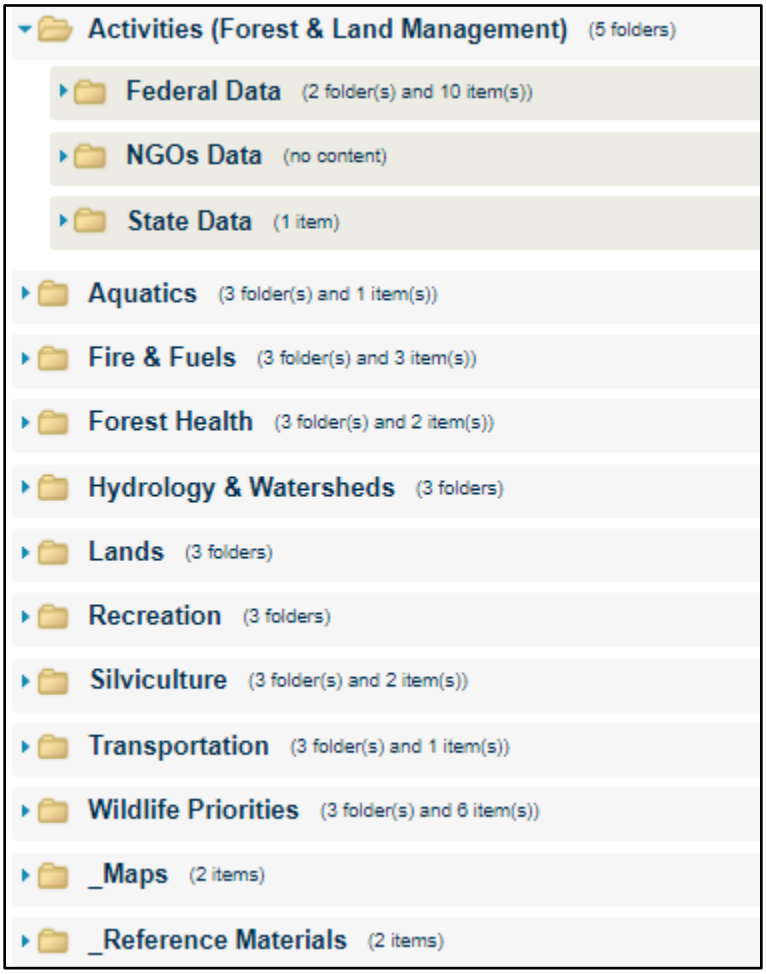


Figure 5: Example Group Structure

Structure Guidelines

The current recommendation is to organize by relevant program areas (activates, aquatics, fire, etc.) and then within each program area, structure by organization type (federal, state, NGOs, etc). More subset folders can be added for temporal organization or more specific organization data layers as needed. However, group structures are fluid and can be updated and changed according to group needs.

Data

Finding Data

Click the 'Explore' tab and then click 'Datasets' to start searching for public data.

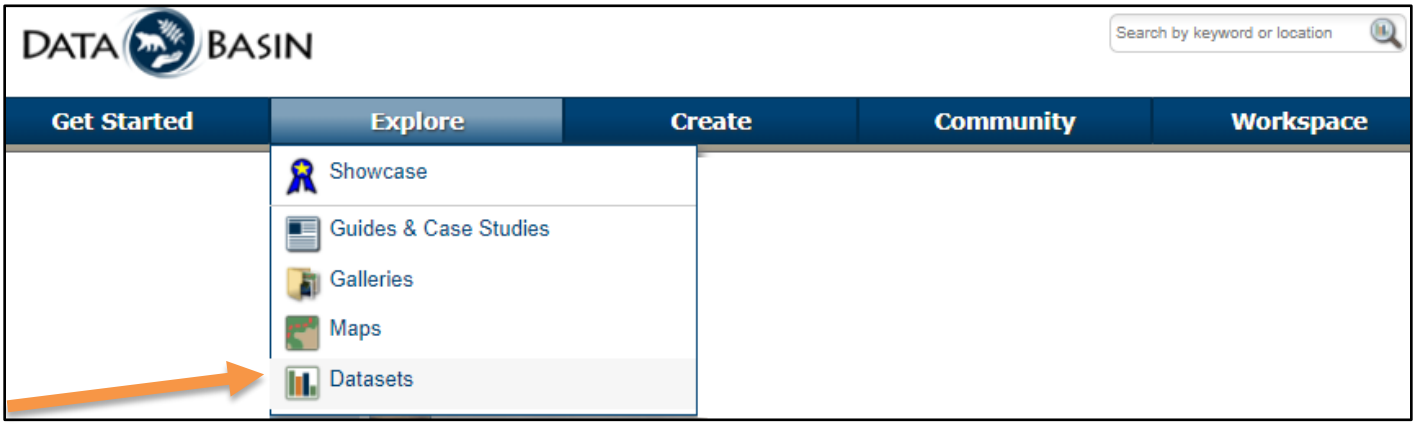


Figure 6: Finding Data. For more information, check out this YouTube video on Searching: https://www.youtube.com/watch?v=ONIMYaRGirM

This option will show recent datasets, popular datasets, recommended datasets, and the search functionality. Clicking the thumbnail will bring up a pop-up with information about the dataset, the owner and the date. Click the link for more detailed information:

Download: If the owner allowed this setting, it will appear above the map with download options.

Open in Map: Open the current dataset in a blank map by clicking here.

Add to…: If you want to come back to this dataset at a later time, click 'Add to…' and select one of the options (Add to Group Workspace, Add to Bookmarks, or Add to Gallery).

Description: This is the owner's explanation of the data

Tags: Any tag words the owner included for that dataset (As mentioned previously, these tags are the key search words for publically available data).

Details Tab: This section includes the metadata, the date, contact info and any use constraints.

Data Layers Tab: This section explains the data layer and its attributes.

Attachments Tab: This section will be available for any documents the owner included with the dataset.

Importing Data

Important!

Before importing a dataset, each user needs to request permission. Click 'Contact Us' at the bottom of the webpage and provide a brief description of the project and you wish to request uploading permissions. Example: "I am participating in the USFS Shared Stewardship effort to support science based strategic decisions using spatial connections with our partners. I need access to upload our

datasets." Once submitted, the user should receive email confirmation and granted the appropriate permissions within 2 business days. Every Data Basin member is provided with 1 GB of free hosting. Additional hosting can be negotiated or purchased if necessary.

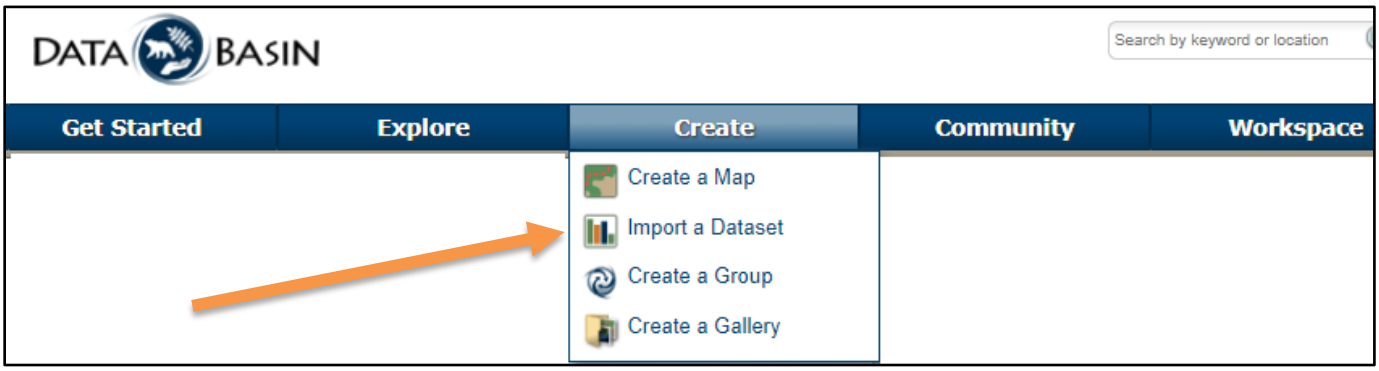


Figure 7: Importing Data

Before importing data, please check the dataset library and confirm it has not been previously uploaded. If not, click the 'Create' tab then click 'Import a Dataset.' There are multiple compatible file formats to import, see instructions below:

Import ArcGIS Layer Package, NetCDF, or Spreadsheet with Spatial Coordinates

- You can upload an ArcGIS layer package (supported formats within layer package limited to: shapefile, file geodatabase, ArcGRID, GeoTIFF, and ERDAS Imagine). ArcGIS Pro layer packages (*.lpkx) are not supported at this time.
- Datasets must be in standard projection based on the following Datums: WGS84, NAD83, South American 1969, European 1950.
- Multi-layer datasets are supported. These are intended for layers that are always used as a collection.
- Upload file must be less than 250 MB. We recommend keeping files less than 150 MB for best performance.
- We recommend that datasets be symbolized for clarity and easy interpretation; please limit to fewer than 25 unique colors or symbols. We recommend against using complex styles such as cross-hatches, stiples, or other cartographic fill / line symbols, as these can take significantly longer to display in the map.
- If valid FGDC metadata is contained in your layer package, Data Basin will import information from that to help fill out information required to import this dataset.
- Labels are not recommended for polygon or line features, as there may be several duplicate labels for a given feature in the map based on how the map behaves. If you require labels for these features, please turn off labels on those features, create a point layer in ArcGIS with representative locations for polygons or lines, turn off symbology and turn on labels for these points, and upload your polygon or line features with this additional layer.
  File geodatabases newer than version 10.2 are not currently supported. Please export and package a 10.2 compatible file geodatabase or use an alternative supported raster format.

Note: Shapefiles are one component of a Layer Package, so in order to upload a shapefile, you will need to right click the layer in ArcGIS and select Create Layer Package. You can select multiple layers to create a group layer package if desired.

See this link for more information for saving layer packages.
http://desktop.arcgis.com/en/arcmap/10.5/map/working-with-arcmap/creating-a-layer-package.htm

Import a Map Service

Map services can be easily imported using the rest URL. For example, any FS EDW datasets can be imported this method.

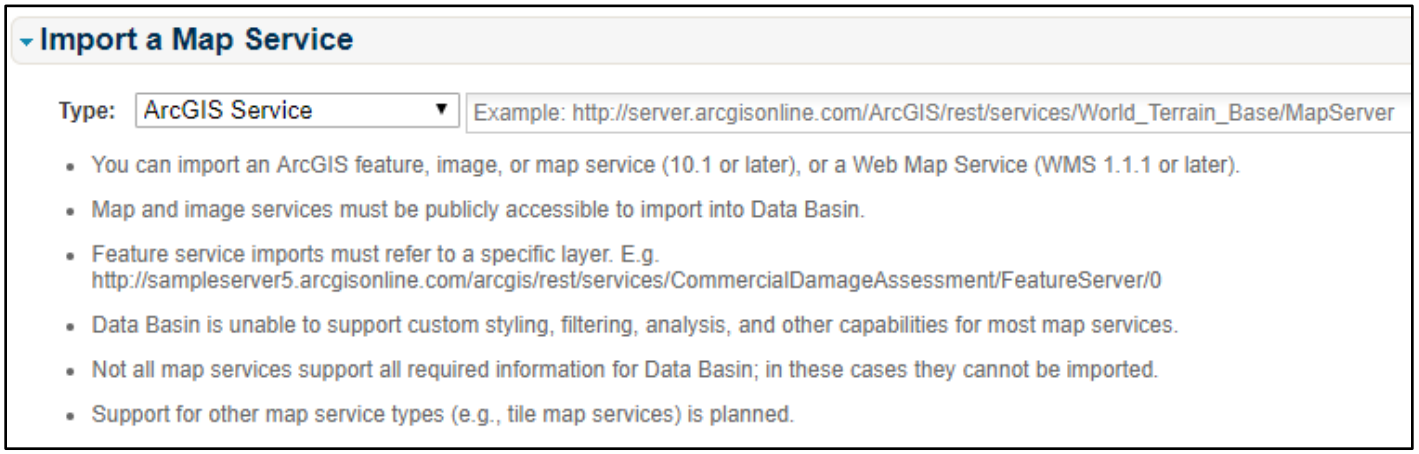


Figure 8: Importing Map Service Instructions

Import from another Catalog

Science Base articles with associated map services are also available for importing.

Figure 9: Importing from Another Catalog instructions

Metadata & Dataset Information

Regardless of what type of datasets the user uploads, the next step is to provide background for the data. There are required fields to uphold the integrity of the data. Most information from Map Services or ArcGIS Layer files will transfer over, however, providing as much information about the data, the owner, the date and any reference websites is very helpful for all users.

Agency Metadata & GIS Guidelines:

- USFS Metadata guidelines please visit this link. For current USFS National GIS Data Dictionary Standards please visit this link)
- For other data guidelines, please visit the agency website.

Required Fields	Optional Fields
Title	Download Link *(for users to find more information and download on their own)*
Credits *(authors, contributors, ex. USFS Forest Health, NRCS, etc.)*	Citation
Description *(Very important! More information is best to provide search ability if a public dataset)*	Review Level *(if it was reviewed in any ways, peer, scientifically, etc.)*
Tags *(provides search ability, ex. Restoration, conservation, NC)*	Contact Organization & Person ***(Highly Recommend adding contact info for all datasets for any future questions)***
Constraints *(important for disclaimers and FOIA concerns)*	Spatial Resolution

Sharing Data

When importing a Dataset, the owner has the option to make it public or private (this setting can be updated in the future). Public datasets will be added to the Data Basin dataset library and will be searchable by dataset name, owner, or tag. Private datasets will be stored in the "your workspace" only. If private datasets are added to a group workspace, the group members will be able to see that data, but not the public.

To edit or share the dataset, click 'Workspace' then 'Datasets.' For limited dataset functions, hover over the thumbnail and click the check mark. Once the image is selected, functions will appear at the top of the screen. The dataset can be added to a map, bookmarks or a group workspace. Within 'Advanced Options' the selected datasets can be made public, private or deleted individually or multiple datasets as a batch process.

For more dataset functionalities, click the dataset title, not the thumbnail. This will take you to the dataset's information, the layers, metadata, description, comments, etc. as well as more editing options.

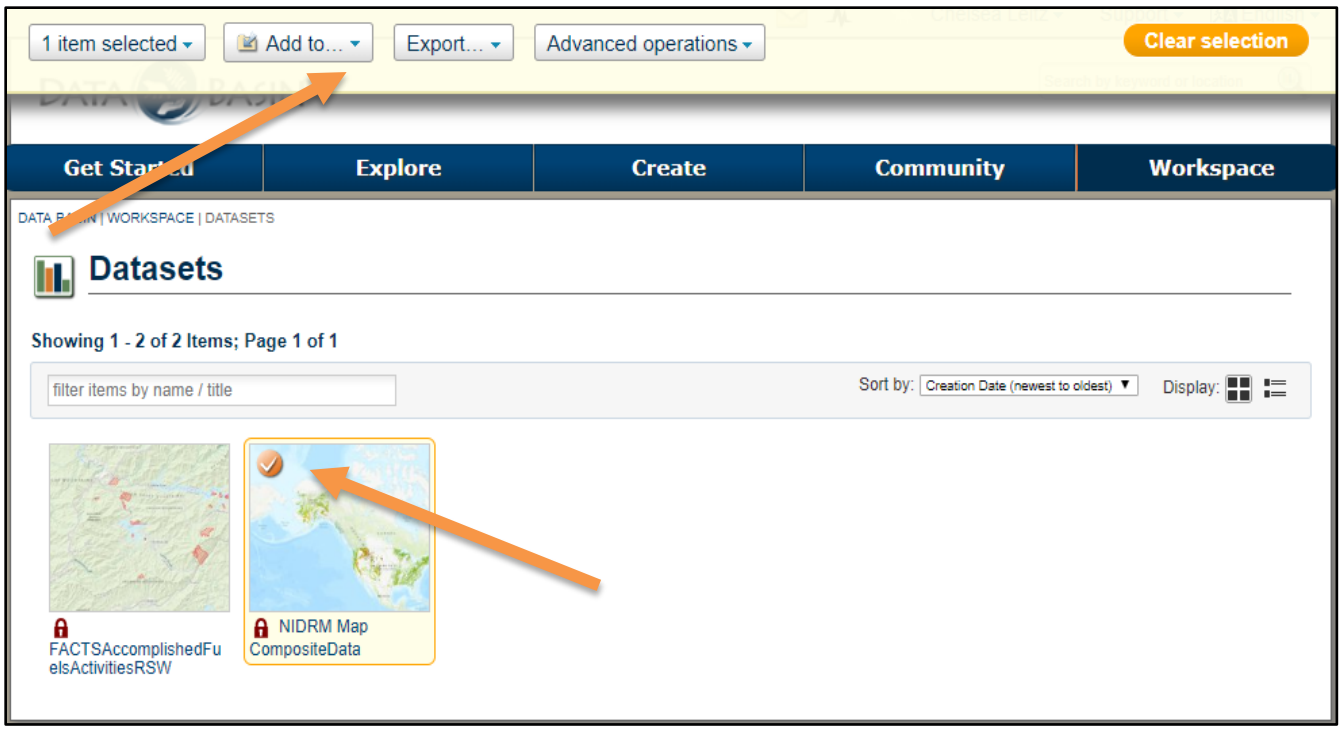
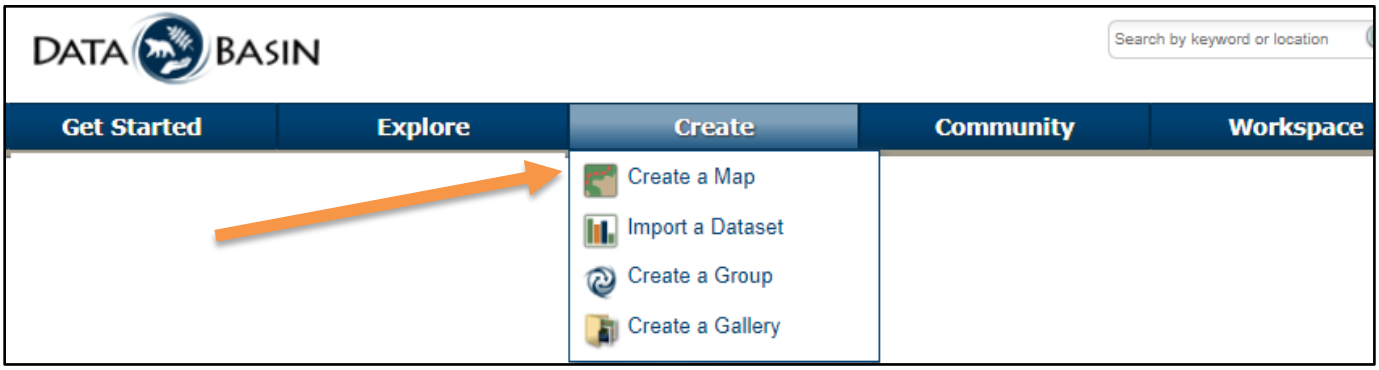


Figure 10: Dataset Functions

Maps

Creating Maps

By clicking the 'Create' tab, you have options to create a map, group, and gallery or import a dataset.



After clicking 'Create a Map', the next screen will be a topographic map. The top will display a toolbar with basic features: save, download, zoom, extend, locate, etc. Hovering over any of these features will display a descriptive pop-up. To the right is a legend that will display your visible datasets. To the left are your drawings, datasets, and base maps.

Remember to always Save or Save as your map!

Figure 11: New map example

Basemaps: To manipulate the base maps, click the drop down 'Basemaps' tab. Options include topography, streets, terrain, imagery, oceans, or light gray. Each option includes labels if desired.

Figure 12: Basemaps Options

For more information, check out this YouTube video on *How to Create a Map*: https://www.youtube.com/watch?v=eWZd-z-sDAQ

Displaying Data in Maps

To add data to a map, click the "Add datasets" button on the left panel. To turn data layers off and on, click the check mark in the box to the left of the data title.

For dataset details and options, click the right arrow. This allows for changes to each individual dataset.

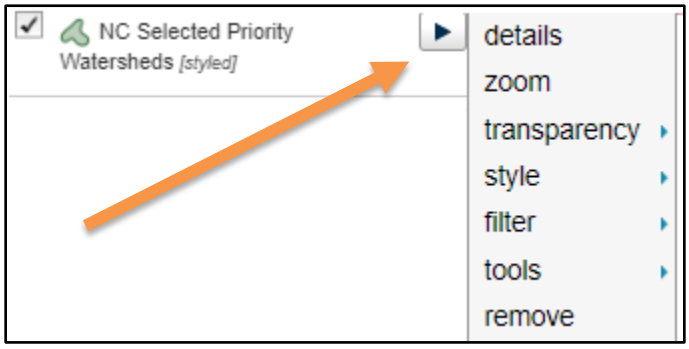


Figure 13: Dataset Options

Details: This tool provides a simple pop-up showcasing the dataset's title, description and owner.

Zoom: Click this function to zoom directly to the selected dataset

Transparency: This allows for the user to set the transparency of the layer, either in 10% increments or user designated amounts.

Style: This tool allows for options to display the data based on the type of data imported. Options include the border and fill colors, the label text and styling based on the data. For example if you wanted to style the data based on the attributes, ex, species types. This functionality all depends on how the owner uploads the data. For most map services, this function is not available.

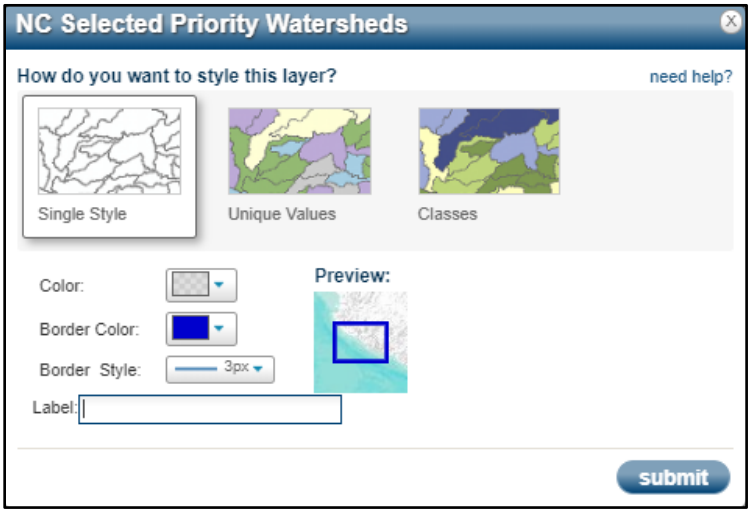


Figure 14: Dataset Style Options

Filter: This tool allows for the user to display filter results. For example, if the data layer has an attribute for acres, the user can specify to display all polygons over 2500 acres, or all polygons over 2000 but less than 2500 acres. Filtering will depend on the type of data imported.

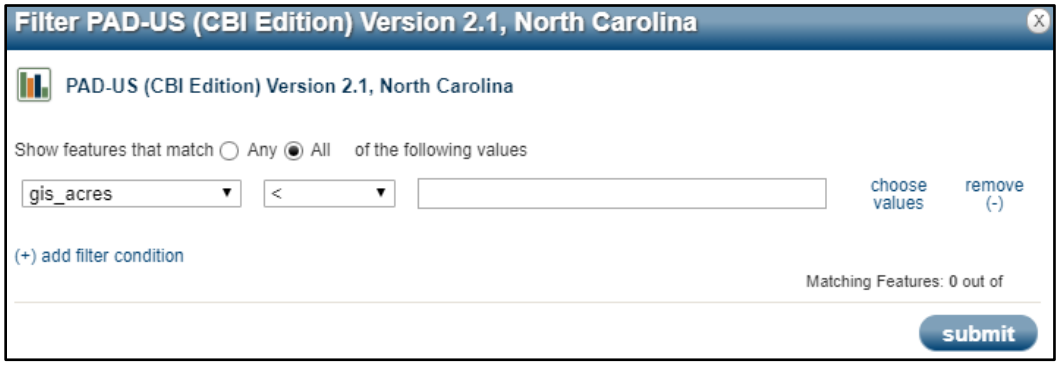


Figure 15: Dataset Filter Options

Tools: *This option is only available for subscription/premium users.*

Select Intersection: This tool will highlight datasets that intersect with the current dataset. This intersection can be exported to a drawing or a shapefile. Buffers or site assessment tools can also be utilized based on the intersection.

Select Attribute: Similar to the Select Intersection tool, this will select features based on an attribute or a specific filter and then highlight them on the map.

Remove: This will remove the selected dataset from the map.

Managing Map Settings

To manage or edit your maps, save and close your map, then click Maps under your Workspace.

Edit Map Overview – This option allows for a quick way to edit the map title, description, tags, and credits. These details were provided during the initial map setup.

Manage Permissions – This function allows map owners to dictate viewer permissions to groups or individual users as well as comment permissions. Allowing users to comment will create another tab with in the map.

Delete Map – Allows for the map owner to delete the map.

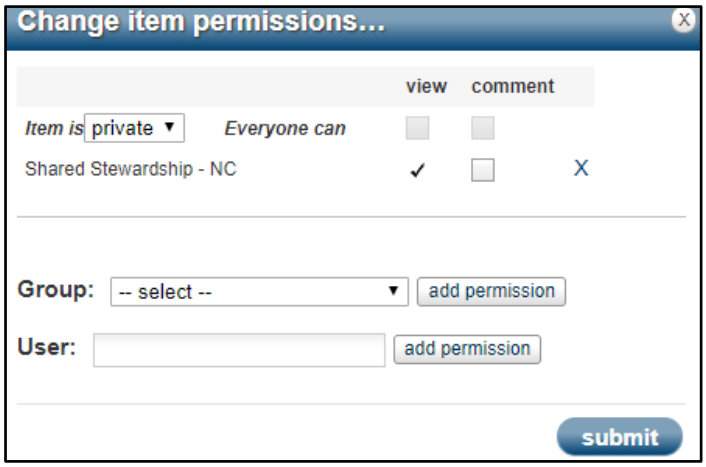


Figure 16: Map Permissions Settings

More Features

Map Tools

Drawing Layer: The Drawing tool allows for the user to draw a layer with points, highlighter, circles, lines, or polygons. This option supports quick identification with the option to save the layer. The fill and border colors can be styled as well as the transparency.

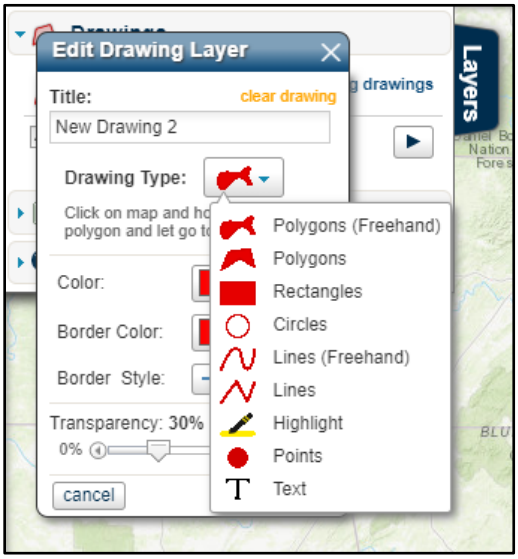


Figure 17: Example of drawing layer

Comment Layer: Commenting is a tool that allows you to comment using markers, lines or areas along with text. Multiple people can comment on a dataset or map supporting collaboration efforts.

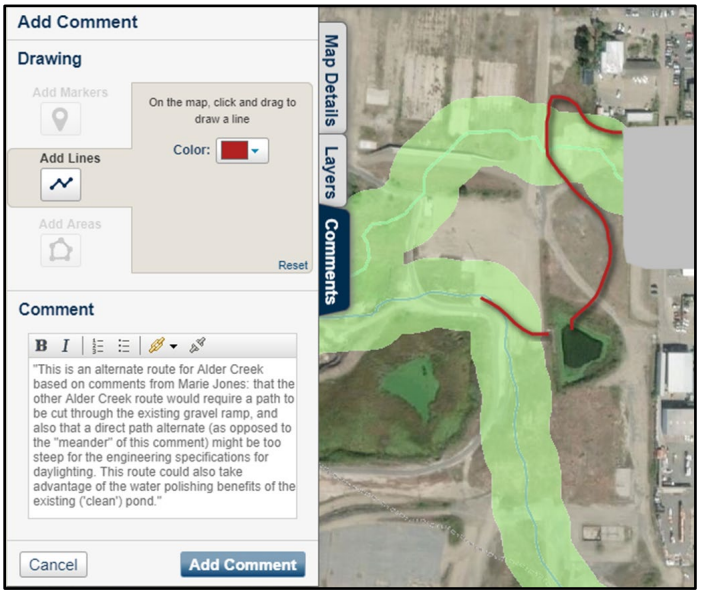


Figure 18: Example of comment layer

Analysis & Manipulation of Data

Data Basin provides basic analysis processes within the mapping application. To complete more complex analyses with the data available on Data Basin, download the data and use tools in a desktop application, such as ESRI ArcGIS or QGIS.

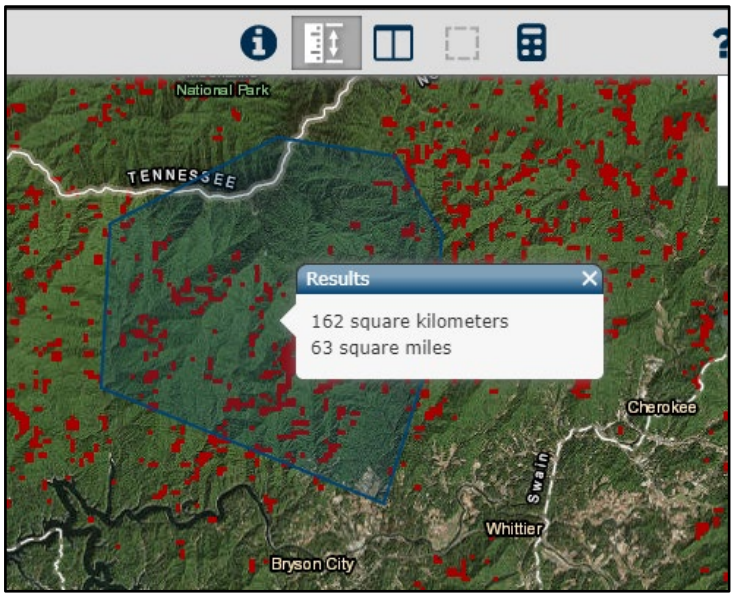


Figure 19: Measuring Tool example

Measuring tool: This tool measures a line or area of a chosen polygon.

Identify tool: Click on a location in the map and display attribute information for all the layers in that location

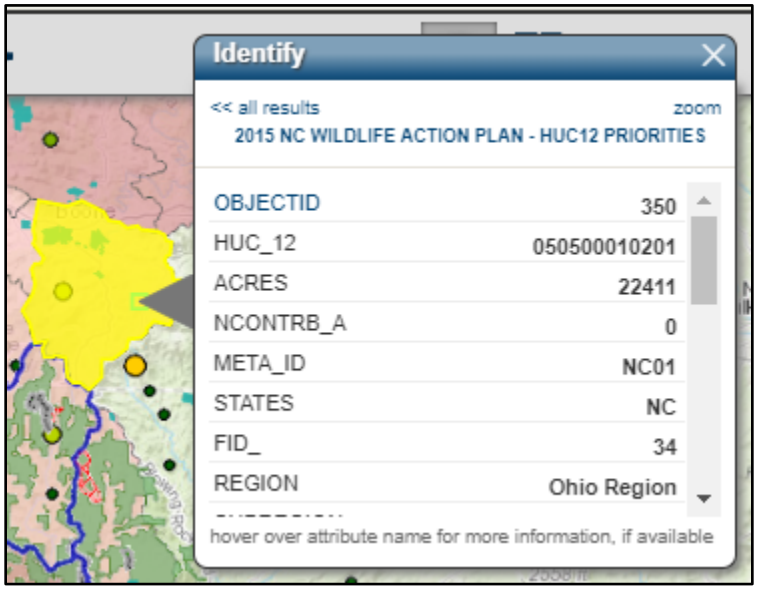


Figure 20: The Identify Tool display screen

Swipe: This tool allows you to swipe across the map screen. Data layers will be designated by the user for visibility on the left or right side of the screen.

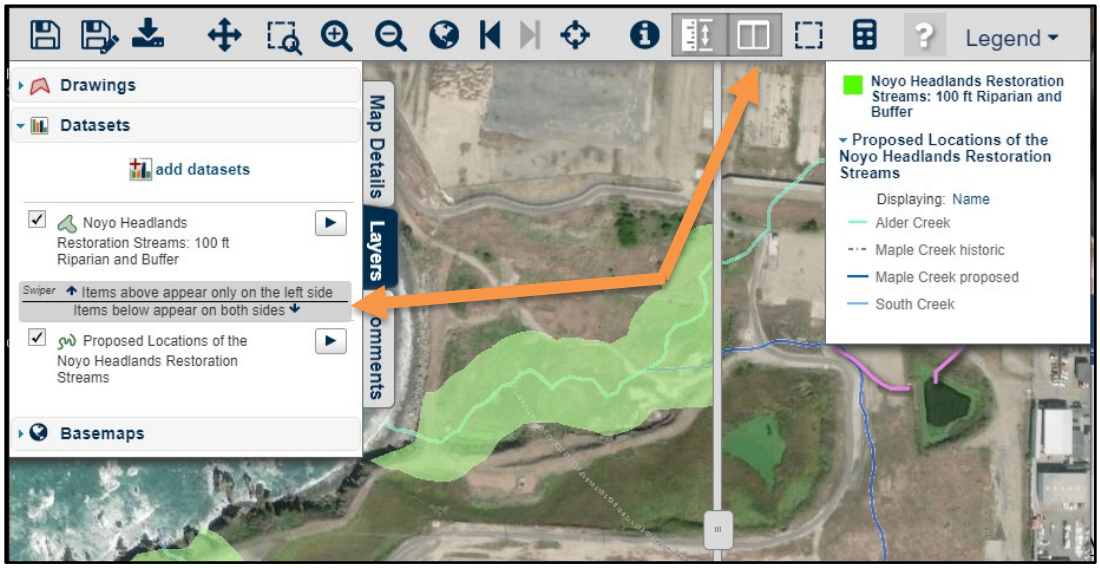
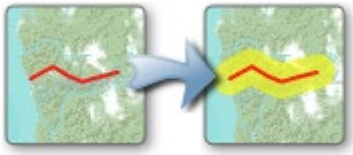
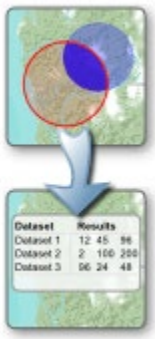


Figure 21: Swipe Tool Display

Buffer: This tool creates a buffer around a point, line, or polygon feature (currently this tool is only available for premium/subscription users).



Site Assessment: This tool uses a drawing (a polygon feature) to identify an area where the user wants to query summary statistics on all layers in that area. It then exports results to a summary table based on selected attributes (exportable to PDF or CSV).



Galleries

Galleries are similar to groups, but for the next stage in data sharing. They are the collection of a group's work and efforts, including resources, articles, maps, etc. They can be public or private, with searchable tags and descriptions, and can be bookmarked to workspaces for frequent reference.

Why create a gallery?

Organize information

- Bring together related items
- Include only the items you want
- Arrange by geography or theme

Showcase datasets and maps

- Highlight project results
- Control privacy

Host data and maps

- Books and atlases
- Journal articles
- Assessments and planning projects
- Educational initiatives

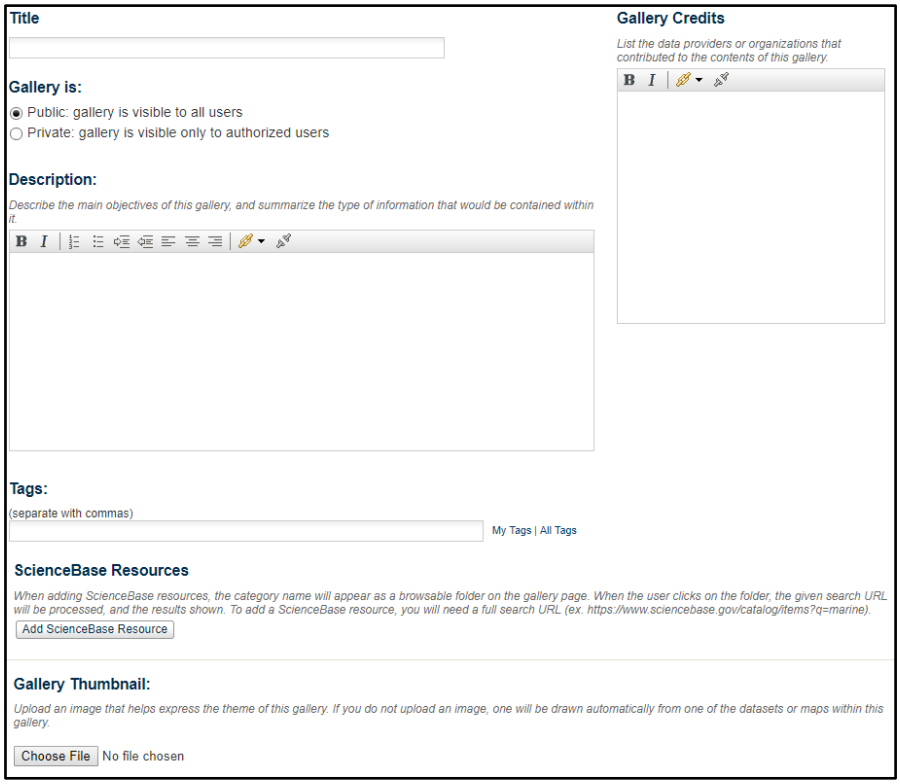


Figure 22: Gallery Example. For more information, check out this YouTube video on How to Create a Gallery: https://www.youtube.com/watch?v=awb-9yhIMPk

Premium/Subscription-based Tools

Premium Mapping and Analysis

Individuals and organizations can use Data Basin's powerful analysis capabilities by subscribing to Premium Mapping and Analysis. A subscription provides access to the following features:

- **Select by Attribute** – Select features within a dataset by using values of attributes. The selected features are highlighted visually and can be used for further mapping and analysis.
- **Select by Intersection** – Select features within a dataset based on an intersection with a drawing, another selection, or another dataset. The selected features are highlighted visually and can be used for further mapping and analysis.
- **Filter Layer by Selection** – Use your selection to limit the visual display of features in a layer. The filtered set can be used as input for further mapping and analysis.

- **Export Selection to Drawing** – Use your selection to create a drawing. Drawings can be edited (color, transparency, and border style) and saved with your map. Drawings can also be used for further mapping and analysis.
- **Export To Shapefile** – Use your selection or drawing to create a shapefile. The shapefile can be downloaded and is ready to use with your GIS desktop software. Note: export to shapefile is subject to the terms of use for the associated data.
- **Buffer** – Use your selection or drawing to create a buffer around a project area. The buffer is created in a separate drawing that can be edited and saved without adjusting your original project area. The buffer drawing can be used for further mapping and analysis.
- **Site Assessment Tool** – Intersect your project area with compatible datasets to find the total count, length, and/or area of intersected features. Produces on-screen results, and supports export to PDF report or spreadsheet.

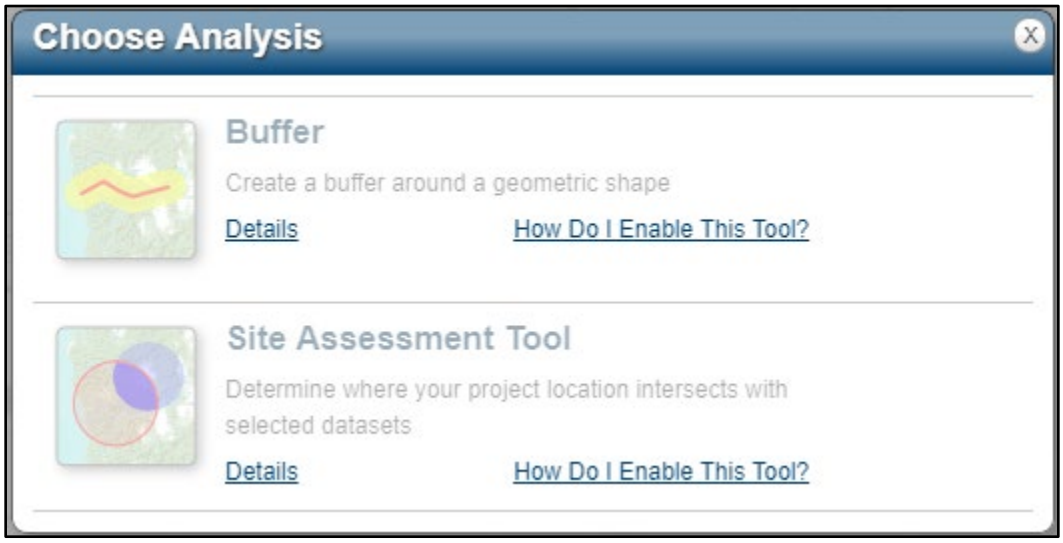


Figure 23: Example of Subscription-based Tools,

Custom Tool Development

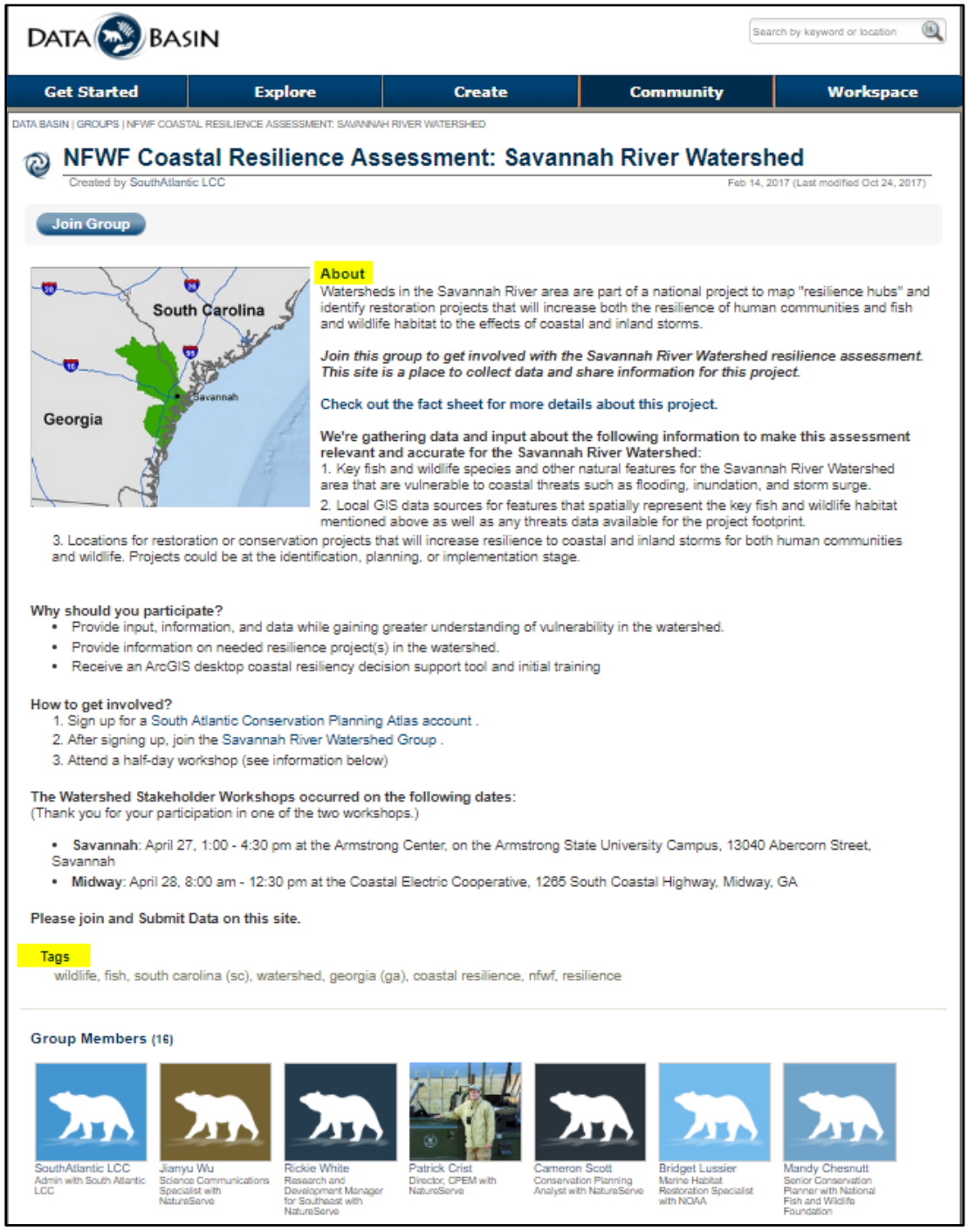
The Data Basin team builds customized decision support, analysis, and reporting tools to solve your specific problems. Customized Data Basin solutions can improve conservation outcomes, drive cost down, improve ability to compete in a 'green market', and improve corporate sustainability. Custom tool development includes:

- Decision support and reporting tools
- Environmental and social risk avoidance
- Mitigation and certification processes
- Resource sourcing options and certification

Appendices

Appendix A

This image is an example of a public group page. The About & Tags sections are important because they identify the reasoning behind the group, who to contact and how to search for related content using the tags.



Appendix B

Disclaimers – Include on information disseminated to the public to explain the products intended usage. USFS Examples below:

Map Disclaimer

This map is intended to depict physical features as they generally appear on the ground and may not be used to determine title, ownership, legal boundaries, legal jurisdiction, including jurisdiction over roads or trails, or access restrictions that may be in place on either public or private land. Obtain permission before entering private lands, and check with appropriate government offices for restrictions that may apply to public lands. Lands, roads, and trails within the boundaries of a national forest may be subject to restrictions on motor vehicle use. Obtain a Motor Vehicle Use Map, or inquire at the local Forest Service office for motor vehicle access information. Natural hazards may or may not be depicted on the map, and land users should exercise due caution. This map is not suitable for navigational use.

Data Disclaimer

The USDA Forest Service makes no warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, and assumes no legal liability or responsibility for the accuracy, reliability, completeness or utility of these geospatial data, or for the improper or incorrect use of these geospatial data. These geospatial data and related maps or graphics are not legal documents and are not intended to be used as such. The data and maps may not be used to determine title, ownership, legal ArcGIS Online Implementation Guide 2019 18 descriptions or boundaries, legal jurisdiction, or restrictions that may be in place on either public or private land. Natural hazards may or may not be depicted on the data and maps, and land users should exercise due caution. The data are dynamic and may change over time. The user is responsible to verify the limitations of the geospatial data and to use the data accordingly.

Appendix C

Example of data import form. Complying with your agency's data standards for any dataset uploads into Data Basin is vital. Additionally, more information is better to help the user determine the purpose and need of that dataset.