Content Management Techniques for your ArcGIS Enterprise Portal

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Content Management Techniques for your ArcGIS Enterprise Portal

Your ArcGIS Enterprise portal, as part of ArcGIS Enterprise, is a powerful way to create, organize, secure, and share spatial and non-spatial content. It centralizes information so that it can be available to the right people at the right time. For many, it is where your layers, maps, files, surveys, dashboards, and applications are organized and discovered. It is also a platform in which to build applications showcasing the work of your organization.

As the ArcGIS Enterprise portal is the gateway to your data and information, administrators, content managers, and GIS professionals often strive to provide the best experience possible. This can be visual, like creating beautiful maps and apps, but also structural, such as providing the right level of access to the right users.

This whitepaper will cover best practices and tips across many facets of content management, from user access, to content creation, to displaying and showcasing your data. The goal is to equip you with techniques to make the best use of your Enterprise portal. With a bit of planning and execution, you can make it an even more enjoyable and informational asset for your organization.

Notes: This whitepaper takes a more "getting started" perspective, though you may find this information useful if you have been working with your Enterprise portal for some time and need to revisit your approach to content management. Many of the concepts here apply to ArcGIS Online as well.

Table of Contents

Enable users with the right level of access

Content management strategies are often centered around ensuring that people have access to—and are using—the right data and information. While this whitepaper covers that concept in detail, it begins with an even more foundational topic: ensuring that users have access to the right capabilities within ArcGIS Enterprise to do their work. For example, ensuring that editors can edit data, content creators can author and publish content, and administrators have administrative access. Within ArcGIS Enterprise, this is controlled through user types, roles, and privileges.

Match users with user types

User types determine what high-level capabilities each member (user) will have. It is likely that there will be some members in your organization that just need to view content, some who will edit, and some who will need to do everything—view, edit, create, analyze, and administer. User types match these common needs and personas. For example, if you have a member who just needs to view data, you can assign them the Viewer user type.

The five general purpose user types in ArcGIS Enterprise are:

Viewer	Editor	Field Worker	Creator	GIS Professional
View	View Edit	View Edit	View Edit Create Analyze Administer	View Edit Create Analyze Administer
+ Essential apps	+ Essential apps	+ Essential apps + Field apps	+ Essential apps + Field apps + Office apps	+ Essential apps + Field apps + Office apps + ArcGIS Pro

Each member of ArcGIS Enterprise is assigned a user type by their administrator as their account is created. This can always be reassigned if needed. For example, if a member, Samantha, joined as a Viewer, but has now shown interest in editing data, her administrator can reassign her user type to Editor, which provides view + edit capabilities.

Note that in order to take advantage of different user types, they will need to be included in your Enterprise portal license.

Leverage member roles

As shown, user types determine the high-level capabilities of each member—view, edit, create, analyze, administer. This is then refined though the use of member roles and privileges. Member roles are sets of privileges and allow privileges to be quickly and systematically assigned. When privileges have been assigned through member roles, certain actions in ArcGIS Enterprise are allowed/shown. Privileges are divided up between general privileges for groups, content, sharing, analysis, and

editing, and administrative privileges for members, groups, content, and system settings. For example, if Samantha is assigned a role that doesn't include the 'edit features' privilege, editing options will be inaccessible to her.

There are five built in roles in ArcGIS Enterprise: Viewer, Data Editor, User, Publisher, and Administrator. Each of these roles include a set of privileges relating to the function of the name (e.g. Publishers can create and publish content, among other privileges). It is common to use both built in roles as well as custom roles, which are roles that you, an administrator, have created to match your user base. As an example, an administrator could create the following custom roles:

- **Contractors** who **can** create and edit data but **can't** view content shared with the organization.
- **Content Managers** who **can** manage groups and content but **can't** create assign licenses or roles.
- **Security Administrators** who **can** change security and server settings but **can't** change the display and settings of the Enterprise portal.

As part of your content management strategy, it is important to ensure that members have just the right amount of privileges, assigned via roles. To determine the roles your organization will need, consider scheduling an exercise where administrators outline the personas who will be using ArcGIS Enterprise. Take a look at the privileges available in ArcGIS Enterprise and determine which will be needed for each member to perform their job. You may find that a range is needed—some members need minimal privileges, whereas some need to be able to do everything, including the ability to administer. If you are creating custom roles, be sure to test them to ensure they meet your organization's needs and expectations.

Advance planning will give your members the ability to do the functions they need to do while limiting administrative overhead in fixing issues and reassigning roles down the line. As your ArcGIS Enterprise environment matures, don't shy away from adjusting members' roles as needed—needs and practices evolve over time. For example, if you find that there is a lot of duplicate content being generated, investigate what content is being generated by whom and adjust as needed. This could involve retraining members and/or changing assigned roles to remove certain privileges like publishing.

Create a convention for usernames

On the topic of members, each member will have their own unique username. Usernames are displayed throughout the Enterprise portal—from item and group ownership to editor tracking. For example, if Kara Sanchez owns an item, it will display to other members who access the item as the following:
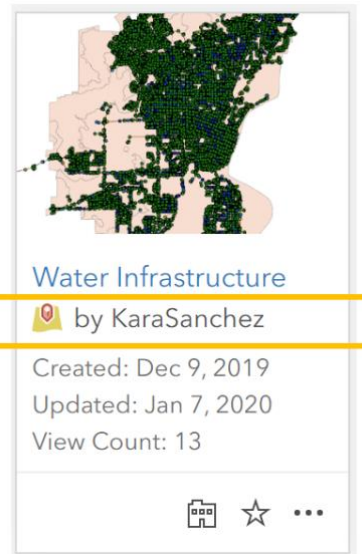
An item with the item owner highlighted.

Therefore, use informative usernames, as other members may have questions, clarifications, and feedback, and need to identify their points of contact. Usernames may be driven by your enterprise identity provider, or your own convention if you are using built-in accounts. Helpful naming conventions can include the individual's full name, their role or department, or other unique identifier such as their employee number if that information is widely accessible.

To go even further, members can make their profile visible to others so they can see the content and groups they own. Members can also include contact information, such as an email address, in their profile.

Develop a strategy for creating and managing content

As this whitepaper focuses on content management techniques and strategies, let's look at different ways content can be created, managed, and monitored using ArcGIS Enterprise and desktop applications like ArcGIS Pro.

Strategize how and what content is created

Within ArcGIS Enterprise, members can create, manage, and share many different types of items, such as web maps, apps, layers, surveys, and dashboards. Workflows can be different for creating each of these items. For example, to create a feature layer, you can publish data from ArcGIS Pro or ArcMap via the user interface or by scripting. You can also create a feature layer by running analysis in your Enterprise portal, or by directly uploading documents like CSVs and publishing layers from those files.

Different types of layers—feature layers, map image layers, scene layers, stream layers—have different capabilities and features. For more information on the relationship between services and portal items, see the help topic Services and portal items. While this whitepaper does not go into detail about when to use each type of layer, there are many considerations that fold into those choices. For more information, this resource provides helpful details: Best Practices for Layers and Service Types. Note that if you are moving from a standalone ArcGIS Server pattern to ArcGIS Enterprise, items will be created in your Enterprise portal for all of your ArcGIS Server services once you federate your ArcGIS Server site with your Enterprise portal. If you are starting with a new installation of ArcGIS Enterprise, you may be starting with more of a blank slate, ready to populate with content.

As part of your content management strategy, think about how you will roll out ArcGIS Enterprise to your organization. By no means do you have to begin by inviting everyone in immediately. In fact, many organizations start by testing the features and functions of the Enterprise portal by providing access to just a few members. Often these are power users and administrators who will be able to test, provide feedback, and set up the Enterprise portal before inviting the rest of your members. This allows you to get a handle on how you want your Enterprise portal to be used with time to course correct. It also gives you time to develop training resources and guidelines, rather than having to retroactively do so.

As members use ArcGIS Enterprise and other parts of the ArcGIS platform like ArcGIS Pro, applications, and more, expect that the amount of content in ArcGIS Enterprise will grow—it's a natural progression! However, if this becomes something you want to regulate, consider:
- Adjusting members' privileges and roles as covered in the last section
- Auditing content quality to make sure it is meeting your organization's standards
- Reviewing which workflows are creating content
- Using features in your Enterprise portal, like content categories and badges, to organize content
- Training or retraining members of your organization

Also consider implementing a strategy around content cleanup. For example, if your organization has 10 layers with similar names (e.g. "Main_Streets") you may consider saving the data locally and deleting the duplicate layers, moving them to a

special 'archive' group, and/or marking the duplicate or out of date layers as deprecated (which will be covered in a later section of the whitepaper).

Take advantage of data maintenance capabilities

Your organization may have—or develop after some time—standards for maintaining, editing, and enforcing data integrity. Within ArcGIS, different options exist based on the specific item type and the origin of the data. For example, a layer that is referencing data in an enterprise geodatabase will have different capabilities than a hosted layer, referencing data in the ArcGIS Data Store. When your layers reference data in an enterprise geodatabase, you can use advanced functionality like versioning, which allows multiple users to edit the same data simultaneously with processes for managing conflicts that arise. You can also use functionality like archiving, which records and accesses changes made to your data over time. Data residing in a geodatabase can take advantage of spatial and attribute integrity through the use of topology, attribute rules, domains, and more. Hosted layers include some of these features, like domains, the ability to create views, and more, but do not have the full set of advanced capabilities available in geodatabase-backed data.

Be sure to review what is possible so you set your data up for success. There are many documentation and blog topics that cover these options, like Manage hosted feature layers and Branch Versioning: Setting the Stage. As part of your content management strategy, consider outlining the goals you have for data in your organization and then choose the right data storage options and service types you need to meet those goals.

Use content provided by Esri

You may find that you need additional contextual layers and data to enrich your own. If so, consider using Living Atlas, an Esri curated collection layers, maps, and apps for imagery, demographic data, real-time weather, traffic feeds, and more. Living Atlas content can be used as operational layers and/or basemaps to supplement your organization's data. As an administrator, you can choose the level of Living Atlas content available: default, subscriber, or premium.
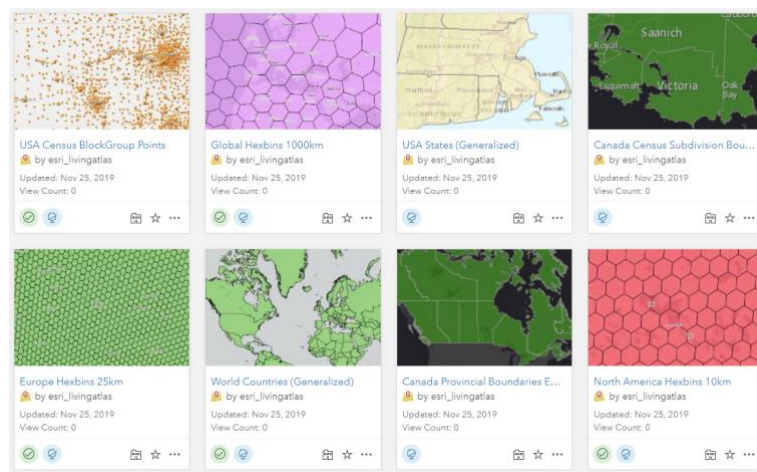
An example of the types of data available via Living Atlas.

Living Atlas content will be separated from the rest of your organization's content on its own tab and filters in the Enterprise portal. Members will be able to add Living Atlas layers to web maps and use them in apps.

If you wish to remove Living Atlas and other Esri-owned items, do not delete them. You can always make them invisible by disabling external content.

Organizations without access to the external internet can use Esri data via the Data Appliance for ArcGIS, and/or by downloading and hosting boundary layers.

Monitor content

Consider developing a regular schedule for you and fellow administrators to monitor content in your Enterprise portal to keep the environment organized, relevant, and up to date. During this time, take stock of your content holistically. For example, if you see multiple items with the same title (especially test!) further investigation may be needed. This content may be cluttering up your Enterprise portal, making it difficult for members to find the information they need.

Below are various ways administrators can monitor content.

Status tab
To visualize statistics on the content in your portal, administrators can use the Status tab in the Enterprise portal under Organization > Status. This is an interactive display of charts and graphs displaying information about items, members, and groups to easily answer the following and more:

- How many items were created within the last <x> months?
- How many items are shared with just the owner, groups, the organization, or the public?
- What are the most common tags used?
- How many items does <member> own and what types of items are they?
- Which items have been viewed the most?

Content tab
As an administrator, you may also find it useful to use filters for a quick look into items across your organization. Using the filters under the Content tab > My Organization, you can understand the number of different item types across the Enterprise portal as well as the date created and last modified (potentially to then remove older items). You can also sort by title as a quick check for duplicate items.

ArcGIS Server Manager
For administrators with access to ArcGIS Server Manager, the application includes a statistics page to view, interact with, and even export usage reports on your services. This can be found under the tab Logs > Statistics.

ArcGIS API for Python
The ArcGIS API for Python is a powerful, easy to use Pythonic library that can be used for mapping, analysis, and data science as well as administration. Managing your content is a way to script common content management workflows such as updating item properties, enabling delete protection, discovering item relationships, and more. Many organizations regularly run scripts to identify items they may want to remove, and/or those that do not meet certain requirements.

Webhooks
Webhooks can be used to monitor activity and report when actions happened in ArcGIS Enterprise. As an administrator, you can set up webhook events around items, groups, users, and roles. For example, you can use webhooks to alert you every time a new item is published or shared. This helps to keep a pulse on what's happening across your environment.

GEO Jobe
An Esri partner, GEO Jobe, has developed tools to help monitor your ArcGIS Enterprise portal, including scanning for users, content, and groups, to help identify issues such as broken references in web maps, items with little or no item details, duplicate titles, and more. For more information on GEO Jobe, contact your Esri Account Manager or Esri representative.

Enforce good quality content and context

A well-organized Enterprise portal makes it easier for your organization to find the right content at the right time. It also ensures that the appropriate information is being used, including information that is up to date and accurate.

How do members know which items to use and for what purpose? A key part of content management is ensuring that your items have the right context applied so members are easily guided to the right resources. Use features of ArcGIS Enterprise to help with this: metadata, item details, tags, content categories, and badges.

Describe content using metadata

One of the best ways to provide context and information on your data is by using metadata. If your organization requires the use of formal metadata standards, administrators can optionally enable metadata and choose the appropriate metadata style for your organization. This allows item owners to include additional standards-based metadata for their items.

Regardless of whether or not you are using formal metadata, every item has an overview page that includes information about that item. The information stored here surfaces across the Enterprise portal with your item. Here is an example of an item overview page:


An item overview page. Not pictured: categories, tags, attribution, and the service URL.

Some of the information here (such as size, source, etc) is automatically populated by the system. However, many of these details are user-generated, whether they are populated from existing metadata on the item or manually added. Adding details to make this page complete is very important. It provides others with context about the item and make it easier to understand what it consists of and how to use it.

As details are added, the green item information bar on the page will progress, encouraging additions until all item details are complete.
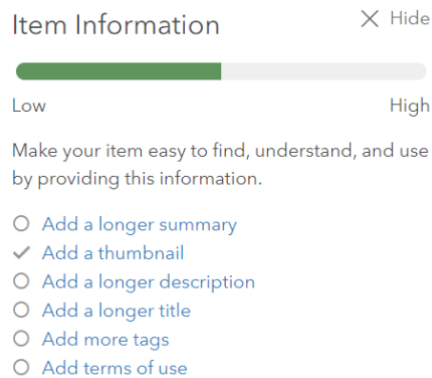
An example of the item information bar, suggesting enhancements.

If you are unsure which items have full item details, consider using the ArcGIS API for Python to return this information for you. The results can then be used as an action plan to update information and potentially retrain members on the use of this information.

Use appropriate tags

Tags are a freeform way of assigning keywords to items. At least one tag is required for each item. While tempting, avoid tagging your items with TEST, ABCDEF, or the like. Use tags as targeted keywords that will help others find and use your items.

Consider using tags that explain what your item and data represents (*weather status*), how often it is updated (*live*), where it is located (*Victoria*), what kind of data it is (*raster*), and even from where it was contributed (*NOAA*). The search algorithm in the Enterprise portal will use both the item title and the item's tags.
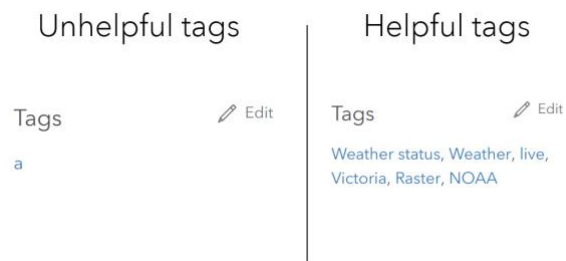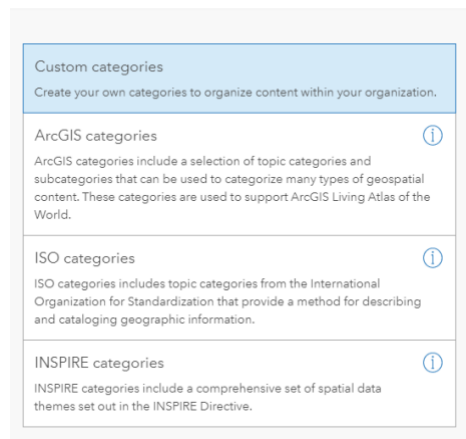

An example of tags created for an item.

Note that while tags can be valuable, due to their freeform nature, they have the potential to become unruly. Consider using the Status dashboard, filters in the Enterprise portal, and even the ArcGIS API for Python to audit which tags are being used and regulate as needed. As part of user training, encourage item owners to assign descriptive and complete tags, and even set expectations or conventions for tagging. For example, to reduce tag clutter, develop a naming convention—always use underscores, never use underscores, include spaces, don't use acronyms, etc.
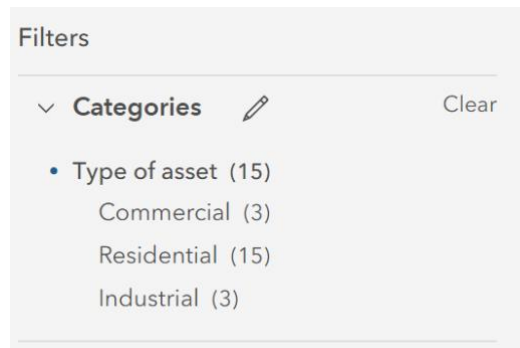
Categorize content

Content categories are another way to classify your data. Whereas tags are freeform, content categories are specific lists created by your organization or selected from a list of standard categories:

Set up organization categories

Custom categories
Create your own categories to organize content within your organization.

ArcGIS categories
ArcGIS categories include a selection of topic categories and subcategories that can be used to categorize many types of geospatial content. These categories are used to support ArcGIS Living Atlas of the World.

ISO categories
ISO categories includes topic categories from the International Organization for Standardization that provide a method for describing and cataloging geographic information.

INSPIRE categories
INSPIRE categories include a comprehensive set of spatial data themes set out in the INSPIRE Directive.

The options for creating categories.

For example, a construction company may want to create 10 categories—one for each client. Or, the company may want to categorize based on the type of project: commercial office, residential, industrial. Each item can be assigned one or multiple categories, and members can use these categories to filter and discover data.


Filters

∨ Categories ✎   Clear

• Type of asset (15)
    Commercial (3)
    Residential (15)
    Industrial (3)

A list of categories used as a filter.

Administrators and anyone with the privilege to manage categories can create and modify the master list of content categories. Item owners can assign categories to their items.

Consider using content categories when there are commonalities across your items and a need to structure how your content is organized and filtered.

Assign and use badges

Badges can be used to filter and find content that meets certain criteria. As you use the Enterprise portal, you may notice system-generated badges on items. Examples of this include items that have been shared to your organization using distributed collaboration and items that are part of Living Atlas:
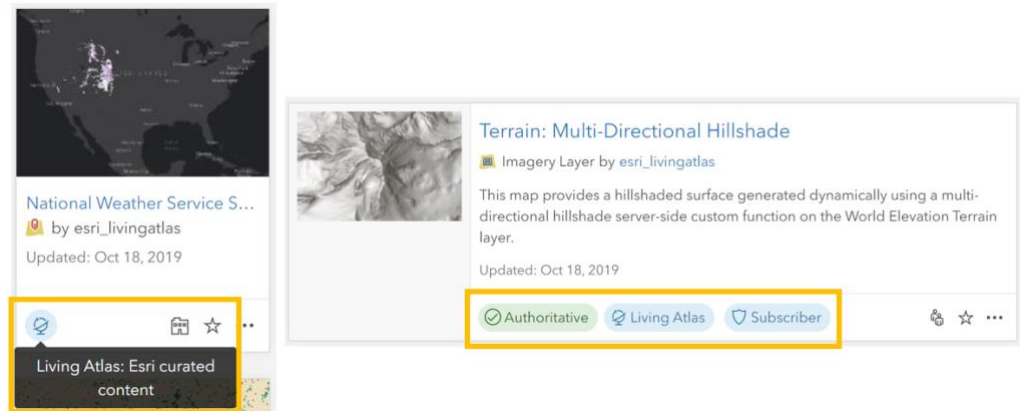
Example system-generated badges on Living Atlas content.

There are additional badges—authoritative and deprecated—that can be assigned to items by administrators. The deprecated badge can also be assigned by item owners.

The buttons to mark items as authoritative or deprecated.

When are these badges helpful? Over time, your organization may accumulate a lot of items. There may be difficulty understanding which items should be used and which should not. Quality items that you want to promote can be marked as *authoritative,* so they rise in searches and signal to users that this is the most up to date, accurate information.

Conversely, items can be marked *deprecated* to signal that this item is outdated. This is a helpful alternative to deleting items that are no longer relevant or up to date. In this case, the item is still available in the maps and apps it is part of, but you've signaled that it is otherwise obsolete and shouldn't be used for new work. Once a badge has been assigned, it will be displayed throughout the Enterprise portal.
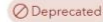
An item assigned the deprecated badge.

An item assigned the authoritative badge.

Members can use these badges to filter content. For example, if you are creating a web map, you can search for only authoritative content in your Enterprise portal so that you ensure your web map has the most recent layers and data.
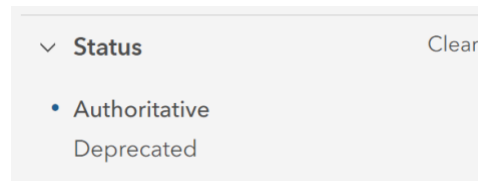
Filters for authoritative and deprecated content.

Administrators can also filter for authoritative and deprecated for a quick look into the number and types of items that have been marked as such.

Manage access to content

Share content within your organization

As an administrator and/or item owner, you will need to provide access to your items by sharing them. There are various sharing settings in the Enterprise portal that range from least level of access to highest level of access.

- Shared with the **owner**
- Shared with a specific **group** or **groups**
- Shared with the **organization** (all members of ArcGIS Enterprise)
- Shared with **everyone** (anyone with access to your ArcGIS Enterprise environment, including anonymous users*, if enabled)

Anonymous users can access shared information but are not members of your Enterprise portal (they do not have a username and password). Anonymous access can be enabled or disabled by administrators.

Note that initially, content that members add or publish will be available only to them (shared with the owner) unless sharing settings are specifically set when publishing (for example, from ArcGIS Pro).

Items across your environment will likely have a mix of sharing settings based on their stage and required level of access. For example, widely used basemaps may be shared with your organization, but confidential sales numbers may be shared with a certain group of members.

On that topic, groups are an important construct in the Enterprise portal. Groups allow you to group your items into meaningful collections of content and allow you to share items with subsets of members—called group members. They can also be used to mass enable editing across all eligible members in the group. And lastly, administrative groups (new starting at 10.8) can be used as filters for members in order to perform administrative tasks throughout the portal.

When are groups helpful? Say you only want to share certain feature layers—those with that confidential sales data—to specific Account Managers. You can create a group, add the Account Managers to the group, and share the layers you need for them to access to the group. This keeps those items secured to only members of that group.

You can also use groups to organize content—for example, creating an analysis group or a basemap group or a field data group. Members can easily search these groups to find items needed for those functions.

When creating a new group, think about the following, which you will enforce through group settings:
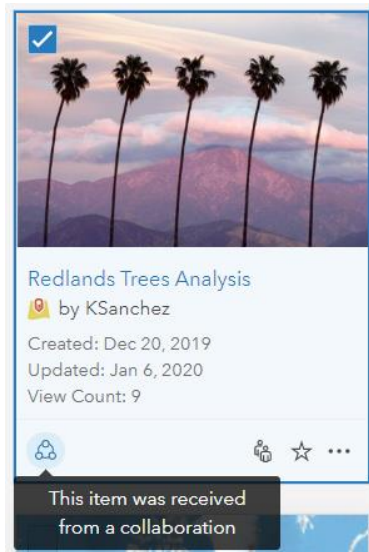
- Who should be able to view this group?
- Who should be able to join this group?
- Who should be able to share to this group?
- Who should be able to update items in this group?

As an administrator or group manager, it is always a good idea to intermittently audit your groups and items to make sure they are set up appropriately with the right level of access. For example, a group with confidential information should likely

not have the setting "who can join this group > anyone." The documentation topic Share items provides additional detail on sharing workflows.

Share content across organizations

Other organizations—partners, departments, clients—may be working with data and information that would be valuable to your organization. As well, your organization may have important information that you need to share with others. With ArcGIS Enterprise, you can use distributed collaboration to securely share information to and from other organizations who are using ArcGIS Enterprise and/or ArcGIS Online. Using distributed collaboration, web maps, apps, layers, and other items can be shared and synced with other organizations via groups, making it easy and efficient to work on projects and workflows together.

Redlands Trees Analysis
by KSanchez
Created: Dec 20, 2019
Updated: Jan 6, 2020
View Count: 9

This item was received from a collaboration

However, with this distributed sharing model comes an increased need to keep content organized and under control. Keep in mind some of these simple tips when it comes to content management for collaboration:

• Name your collaboration groups something relevant to the purpose of the collaboration to provide context.
• Ensure that details about your item (titles, summary, thumbnail, description, tags) are fully populated when sharing content.
• Use badges (shown to the left), tags, filters, and content categories to organize items.
• Train relevant members of your organization so they are aware of the sharing workflows and the intent of the collaboration.

Many organizations have implemented distributed collaboration and are using different patterns of sharing. Read through the Three Rivers Park district case study and the Farr West case study for success stories.

Display and showcase content

Though the Enterprise portal is used to manage content, it does not have to be the only experience for end users to discover your organization's data and maps. Many organizations choose to use various applications as the way to interact with all types of data and resources. It is up to your organization to choose what works best for you and your users. Your chosen front-end interface may vary across your organization depending on the workflows you want to guide users to and their level of expertise.

This section provides information on the different ways that users can interact with and discover content, including directly within the Enterprise portal, using ArcGIS Enterprise sites and pages, and using configurable applications.

Display items in your ArcGIS Enterprise portal

To guide members of your Enterprise portal to certain maps, apps, and data from directly within your portal, you can use the Home and Gallery tabs.

Administrators can customize the display of these tabs and choose which group to feature. On the Home tab, content will be displayed in a carousel format, and users can scroll through to find relevant information (shown below). On the Gallery tab, items will be displayed in a card format and users can filter, search, and sort through pertinent information.
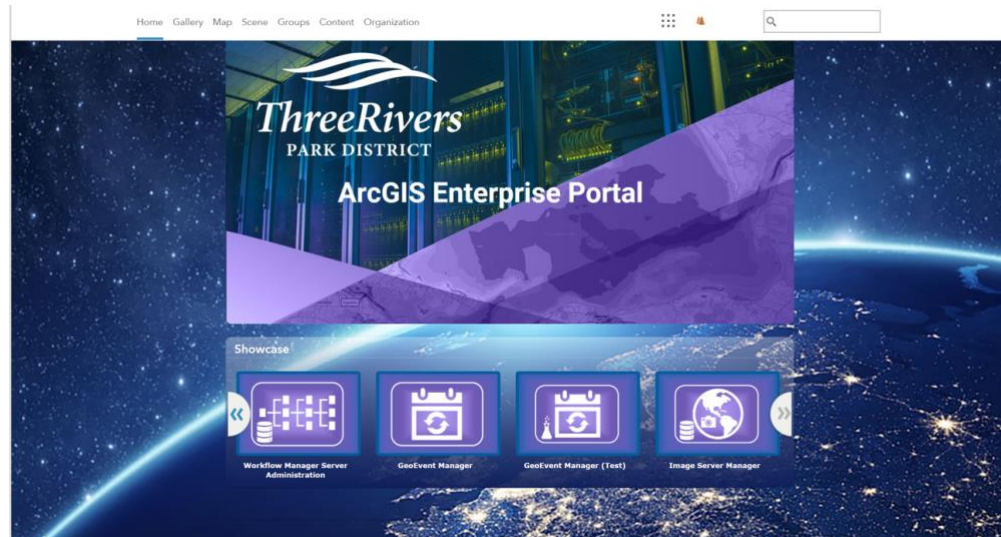
An example of Three Rivers Park District's Home tab, providing quick access to different pages.

You can also leverage the App Launcher to pin certain apps and links.

Aside from these two tabs, there are additional ways of making the experience of finding content and information more efficient in your Enterprise portal. Many members may sign into your portal and first search for the content they are looking for using keywords. This is where the tips around item details, tags, categories, and badges come into play. Members can search more effectively when items have complete and accurate details.
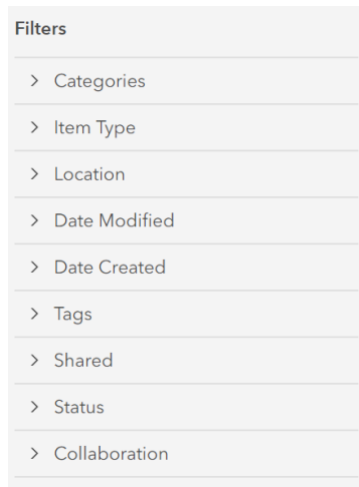
A list of all filters available in the Enterprise portal for content.

Members can search the entire portal for content or perform more focused searches within content they own, groups, favorites, and Living Atlas. Though a keyword search will return relevant items, some members may want to perform more advanced searches for specific item owners or tags. This topic, find and work with content, provides guidance on how to make the best use of advanced searches.

Encourage the use of filters as needed to find content. There are many filters available to further refine searching, from date modified, to the extent (location) of an item. These filters are available when searching the Enterprise portal and when adding content to a map. Filters can make finding content even more time effective and targeted.

If your members frequently access certain items, they can favorite them for quick access later. All favorited items can be accessed through the My Favorites tab in the portal.
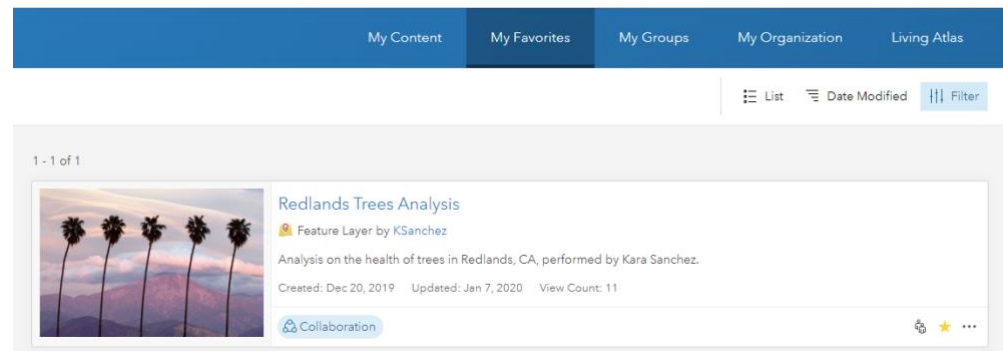

The My Favorites tab displaying a favorited item.

Showcase information using ArcGIS Enterprise Sites

The methods covered above—the Home and Gallery tabs—have relatively static interfaces. Though you can choose which items to showcase, the format and display of the page itself is more or less fixed. For organizations who need to display content in a specific way, there is ArcGIS Enterprise Sites.

With ArcGIS Enterprise Sites, you can interactively display information using customized, branded websites and pages that showcase content—maps, dashboards, layers, data—in your Enterprise portal. For many organizations, this is a way to reach audiences that typically are not familiar with the ArcGIS Enterprise portal or GIS. Sites can provide a friendly and familiar way of guiding your audience to your content. On your sites and pages, you can also add text to contextualize your maps and apps, which can help walk your audience through your content.

Many organizations create sites and pages that are specific to certain divisions, departments, or user groups. An example of this would be a fire department site and police department site.
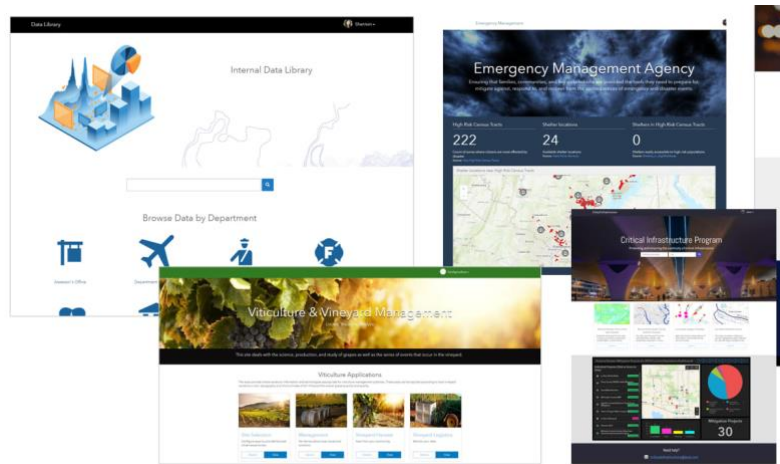
An example of websites created with ArcGIS Enterprise Sites.

Build configurable applications

Many organizations use other Esri applications—Web AppBuilder, ArcGIS Dashboards, configurable application templates—to display their data and drive key workflows. Web AppBuilder is a quick way to create an application without code; it also helps drive app users to specific workflows and actions. ArcGIS Dashboards provide a real-time overview of the status of your data and help to measure key performance indicators. Configurable application templates back data and map-centric applications for exploring data, providing local information, and more.

The idea is that different end users may be better suited to consume your data and maps in various ways—and there are many ways to showcase your data in ArcGIS. You may find that users of the Enterprise portal interface itself are those who are creating and editing content and doing GIS-centric workflows. However, viewers and users in other departments may be better suited to access information in an application, be it an Enterprise site, or a dashboard.

Takeaways

ArcGIS Enterprise, including the ArcGIS Enterprise portal, is an incredibly effective and powerful way to make data and information available to your organization. Ensuring that your members, items, and groups are properly set up and maintained makes the best use of your portal and the content you create and share.

As you work with ArcGIS Enterprise, remember the topics covered in this paper:
- Providing the right level of access to members via user types and roles
- Developing a strategy for content creation and management
- Enforcing good quality content and context across your organization
- Managing access to content via groups and sharing settings
- Displaying and showcasing content across the Enterprise portal and applications

You can always reference back to this whitepaper for techniques and strategies. As needed, share it with other members of your organization as a training resource or reference guide. Many organizations find it effective to create their own user manuals, guidelines, and training tools to help ensure consistency and alignment with best practices. You can also work with Esri Professional Services in this area.

For more information on these topics, reference the ArcGIS Enterprise documentation, the ArcGIS Enterprise Quick Start Guide and the Data in ArcGIS whitepaper.