

ArcGIS Maps for SharePoint User Guide



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What's new in ArcGIS Maps for SharePoint

Do you have an idea for a feature you'd like to see in ArcGIS Maps for SharePoint? Tell us about it at the [ArcGIS Ideas](#) site.

ArcGIS Maps for SharePoint 4.2 includes the following updates and enhancements:

- Apps rebranded as ArcGIS Maps for SharePoint.
- Added support for SharePoint Server 2016.
- ArcGIS Maps for SharePoint Online is now a single app that contains both the ArcGIS Maps app part and the ArcGIS Maps Locate workflow.
- ArcGIS Maps for SharePoint Online is now supported in sub-sites.
- Enhanced security solution allows SharePoint administrators to use choose how to securely store ArcGIS credentials.
- Added support for ArcGIS Enterprise 10.5.
- Added support for vector tile basemaps.
- You can now add SharePoint lists and documents to an ArcGIS Maps app from sub-sites and sub-folders in a document library.
- ArcGIS Maps for SharePoint supports anonymously accessible map web parts on public-facing SharePoint sites.
- Enhanced user experience for adding SharePoint lists to a map.
- Enhanced user experience for app configuration and ArcGIS Maps Locate workflow.
- Multiple bug fixes and improvements.

ArcGIS Maps for SharePoint and ArcGIS

With ArcGIS Maps for SharePoint, you can easily create maps that combine your SharePoint data with published geographic content from ArcGIS. You can also share the maps you create in ArcGIS Maps for SharePoint with others within and outside of your organization using ArcGIS. ArcGIS provides an online infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the web.

ArcGIS Maps for SharePoint works directly with your organization's ArcGIS subscription to allow you to access geographic content to enhance your business data. You must be signed in to ArcGIS to use ArcGIS Maps for SharePoint; depending how your administrator has configured the application, you may be prompted to enter your ArcGIS credentials. Your subscription includes a number of service credits, which are the currency of ArcGIS and are used in exchange for most of the ArcGIS services your organization uses. The number of service credits required depends on the type of service you are using. To help you estimate how many service credits you will need, see [Understand credits](#).

With ArcGIS Maps for SharePoint, you can easily add data from ArcGIS to your map to help you visualize your data in new ways. Once you have created the desired maps and layers in ArcGIS Maps for SharePoint, you can publish them to ArcGIS to share them with others.

Prepare SharePoint data

ArcGIS Maps for SharePoint allows you to add content to the ArcGIS Maps web part from several sources, including SharePoint lists in your site collection, external SQL server tables, and ArcGIS Online or ArcGIS Enterprise. Before you can add data to the map, the list items must be spatially enabled (geocoded) using the ArcGIS Maps workflows. Geocoding is the process of taking data, such as an address, and converting it to a coordinate that corresponds to a location in a coordinate system.

ArcGIS Maps for SharePoint includes two workflows to help you geocode different types of data:

- ArcGIS Maps Locate workflow
- ArcGIS Maps Connect workflow (for SharePoint on-premises only)

The following table provides information about how to geocode different types of data.

Data source	Process to add to a map
SharePoint list with address data	Run the ArcGIS Maps Locate workflow. See Geocode lists containing address or place name data . This process consumes ArcGIS credits .
SharePoint list with place names such as U.S. city, U.S. state, and World country	Run the ArcGIS Maps Locate workflow. See Geocode lists containing address or place name data .
SharePoint list with coordinate data	Add the ArcGIS Location field to the existing list. See Geocode lists containing coordinate data .
External SQL Server tables	Run the ArcGIS Maps Connect workflow to create a connection to the external content. The ArcGIS Maps Connect workflow includes the ArcGIS Maps Locate workflow. See Connect to external data .
ArcGIS (ArcGIS Online or ArcGIS Enterprise)	No geocoding necessary. See Add data from ArcGIS .

ArcGIS Maps Locate workflow

The ArcGIS Maps Locate can geocode SharePoint lists that contain the following location types:

- **Address**—In the United States, address data is comprised of street name, city, state, ZIP Code, and country. There are similar address elements in other countries. The more address elements your data contains, the more accurate your results will be. You can find a complete list of countries for which there is address coverage in the **supported countries** link on the [World geocoding service overview](#) page.
- **US city, State, ZIP code, World city, and Country**—Cities (US city and World city) are added to the map as points. States, ZIP codes, and Countries are added to the map as polygons, which represent both the shape and the location of the place. When entering World countries, you can use the [Geonames country codes](#) as a reference for accepted spelling variations.
- **Custom location types**—This feature allows you to use a hosted service from ArcGIS Online to specify a location type. For example, if your organization has its own boundaries (water districts, sales districts, zoning boundaries) shared on ArcGIS Online, you can map your spreadsheet data using those locations instead of the default location types.

The ArcGIS Maps Locate workflow requires a connection to the ArcGIS platform to access the ArcGIS [World geocoding service](#) for geocoding addresses. By default, the ArcGIS Maps Locate workflow connects to <http://www.arcgis.com>, but you can change this connection string to point to a ArcGIS Enterprise instance by editing the [ArcGIS connection URL](#). If you're connecting to a ArcGIS Enterprise portal instance, the default locator of your portal instance is available when running the ArcGIS Maps Locate workflow.

 **Note:** If you're connecting to a ArcGIS Enterprise instance and do not see the fields populate on the **Choose the columns with location information** page of the ArcGIS Maps Locate workflow, set the geocoding service to be available to Everyone.

When the ArcGIS Maps Locate workflow executes on a list, it adds new columns to the list. For point items, ArcGIS Location, ShapeX, and ShapeY columns are added; for line and polygon items, an ArcGIS Location and single Shape column are added. The ShapeX and ShapeY (or Shape) fields store the geographic coordinate data for the list item. The ArcGIS Location field stores the geometry for the list item in JSON format; this can be a point, line, or polygon, and embeds an interactive map in each item's form, which allows you to view and [manipulate an item's location](#). To remove these columns, use the **List Settings** page for the list.

Column (click to edit)	Type
Name1	Single line of text
Street	Single line of text
City	Single line of text
State	Single line of text
Zip	Single line of text
Employees	Number
Date	Date and Time
ShapeX	Number
ShapeY	Number
ArcGIS Maps Location	ArcGIS Maps Location
Shape	Multiple lines of text

ArcGIS Maps Connect workflow

Business data often resides in many places. ArcGIS Maps for SharePoint leverages SharePoint's Business Connectivity Services (BCS) to retrieve data stored in Microsoft SQL Server (including SQL Server Express) and pull it in to SharePoint. BCS creates an external content type in SharePoint that allows for read and write access to the connected table. This means that not only can SQL Server external content be added to a connected list in SharePoint, but changes made to the list by the ArcGIS Maps Connect workflow—including location information and enriched attributes—are written back to the original table. The ArcGIS Maps Connect workflow results in a regular SharePoint list, not an external list. That said, the fields created from the SQL database are of an external type, and any edits made to these fields in SharePoint cannot be passed back to the database. SharePoint only passes back the fields it has created, such as those created for the ArcGIS Maps Locate workflow or geoenrichment.

The ArcGIS Maps Connect workflow creates a connected list—a SharePoint list that maintains a connection to the underlying SQL server database. The SharePoint Business Connectivity Service (BCS) uses SharePoint timer jobs to maintain and update the connection between the SQL Server database and the connected SharePoint list. By default, the timer job runs once every hour, but you can change this setting in the **SharePoint Central Administration**.

 **Note:** If you are using the ArcGIS Maps Connect workflow as a Windows service, you must manually restart the SharePoint Timer Service after you install ArcGIS Maps for SharePoint.

The ArcGIS Maps Connect workflow walks you through the process of connecting to your SQL Server database, selecting the applicable table, creating the connected list, geocoding the list, and enriching the list with demographic and other contextual data—all without custom code or programming. After you create the connected list, you can add the list data to the ArcGIS Maps web part.

Import Excel spreadsheet data

There are several best practices for importing Excel spreadsheets that will be used with ArcGIS Maps for SharePoint:

- Your spreadsheet must be formatted as an Excel table.
- Ensure your spreadsheet contains no blank columns or rows.
- Ensure each column has a header (title).
- When you use a list that was created by importing an Excel spreadsheet, be aware that SharePoint takes the first text column in your spreadsheet and sets that as the title field with a hyperlink to the original spreadsheet. The ArcGIS Maps web part does not include hyperlinked fields when adding data to the map (that is, content in the title field will not appear in pop-ups). This means that you may need to modify your default list view in SharePoint to include the appropriate fields for displaying information in pop-ups and for connecting web parts.
- Use Internet Explorer to import data from an Excel spreadsheet; Chrome and Firefox browsers do not support importing Excel data into SharePoint.

 **Note:** If you are new to creating and working with lists in SharePoint, see the following guides for more information:

- [SharePoint lists I: An introduction](#)
- [SharePoint lists II: Create and work with different lists](#)
- [SharePoint lists III: Create a list based on a spreadsheet](#)

Geocode lists containing address or place name data

Add the ArcGIS Maps Locate workflow to a list

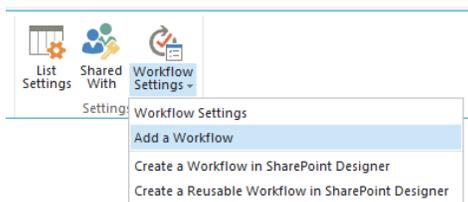
- Note:**
- Before running the ArcGIS Maps Locate workflow, ensure you have met all of the [system requirements](#) and properly [configured the app](#).
 - If you receive the following error: Access is denied to the Secure Store Service, see the [Frequently Asked Questions](#).
 - Custom geocoders must be proxied or federated and made public.

SharePoint lists containing address data must be geocoded—or spatially enabled—before you can add the data to the ArcGIS Maps. Geocoding is the process of taking data, such as an address, and converting it to a coordinate that corresponds to a location in a coordinate system. You can geocode lists containing addresses, U.S. cities, U.S. states, U.S. ZIP codes, world cities, and countries using the ArcGIS Maps Locate workflow. Only geocoding lists containing addresses using the Esri World Geocoder consumes [ArcGIS service credits](#). Other options, such as ZIP codes, states, counties, or countries, are considered standard geographies and do not consume credits.

The [ArcGIS Maps Locate workflow](#) requires a connection to the ArcGIS platform, either ArcGIS Online or ArcGIS Enterprise. By default, the ArcGIS Maps Locate workflow connects to <http://www.arcgis.com> but your SharePoint site administrator can change the ArcGIS connection URL when configuring the app.

To add the ArcGIS Maps Locate workflow to a list, do the following:

1. Browse to the applicable list in your SharePoint site.
2. On the **List** tab, click **Add a Workflow** from the **Workflow Settings** drop-down menu.



3. On the **Add a Workflow** page, choose **ArcGIS Maps Locate** as the workflow template and type a name for the workflow. Optionally, you can configure the task list, history list, and start options.

Settings - Add a Workflow

Workflow Details

Workflow
Select a workflow to add to this list. If a workflow is missing from the list, your site administrator may have to publish or activate it.

Select a workflow template:

- ArcGIS Maps Locate**
- *Disposition Approval
- *Three-state

Description:
Spatially enables items in a SharePoint list so they can be visualized in the ArcGIS Maps for SharePoint map web part.
*Denotes a SharePoint 2010 template.

Name
Enter a name for this workflow. The name identifies this workflow.

Enter a unique name for this workflow:
ArcGIS locate

Task List
Select the name of the task list to use with this workflow, or create a new one.

Select a task list: Tasks Description: Tasks

History List
Select the name of the history list to use with this workflow, or create a new one.

Select a history list: Workflow History Description: Workflow History

Start Options
Specify how this workflow can be started.

- Allow this workflow to be manually started by an authenticated user with Edit Item permissions.
 - Require Manage Lists Permissions to start the workflow.
- Start this workflow to approve publishing a major version of an item.
- Creating a new item will start this workflow.
- Changing an item will start this workflow.

Next Cancel

- To automatically update the location of items you make changes to the list, check the **Creating a new item will start this workflow** and **Changing an item will start this workflow** boxes.
- Click **Next**.
The ArcGIS Maps Locate workflow page opens.

Run the ArcGIS Maps Locate workflow

- Specify how location is represented in your data.
Available choices are: Address, U.S. City, U.S. State, U.S. ZIP Code, World City, and Country.
To [add a custom location type](#), click **Add location type**.

Note: If you are connected to an ArcGIS Enterprise instance, the location choices you see may be different from those shown above. Contact your ArcGIS Enterprise administrator for more information.

- Click **Next**.
- Choose the columns in the list that correspond to the input parameters.

ArcGIS Maps Locate Workflow Wizard

Address Details
Help us locate your data more accurately by telling us what country or countries it falls within.

One country:
United States x

Many countries

Location Columns
Tell us which columns in your data contains location information.

One column:
< None >

These columns:

Street:
Street

City:
City

State:
State

ZIP:
Zip

ZIP4:
< None >

Country:
< None >

Back Next Cancel

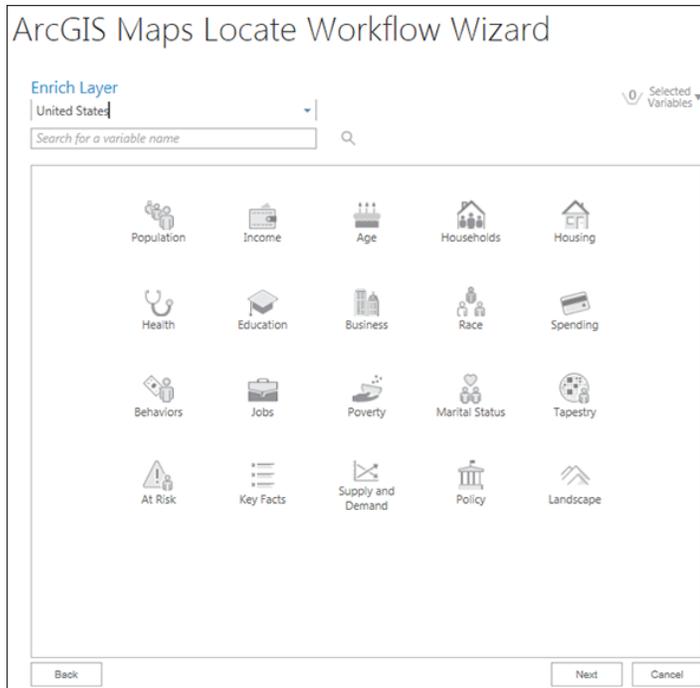
Note: If you are connected to ArcGIS Enterprise and do not see these columns appear, set the geocoding service on the portal to be accessible by everyone.

4. Choose the columns to add.
Boxes with grayed-out checks indicate required columns that are added automatically. The field selections on this page are only respected if you are using the custom location type. For standard location types, all fields are added.
5. Click **Next**.
6. You can optionally enrich your data with geographic data enrichment variables from ArcGIS. Data enrichment variables are contextual variables available for locations throughout the U.S., Canada, and some countries in Western Europe. Available variables include demographic and socioeconomic factors, age distributions, landscape data, and area wealth information.

Note: Geoenrichment capabilities are supported only with ArcGIS Online , Portal for ArcGIS 10.3 through 10.4.1, and ArcGIS Enterprise 10.5 and later.

To enrich your data, do the following:

- a. Check the **Enrich data** box and click **Next**.
The data enrichment pane opens.



- b. Click the country drop-down menu and choose the country for which you want to see demographics. The list of collections changes depending on the available collections for the selected country.
 - c. Optionally, type keywords in the search field to search for specific variables. Press **Enter** or click the magnifying glass to search.
 - d. Choose a data collection.
You can search for variables within a collection, choose one of the popular variables within the collection, or show all variables in the collection.
 - e. Choose the variables you want to add to your list and click **Next**.

Note: The basket icon in the upper right corner of the window shows the number of variables you've chosen. Click the basket to view its contents. To remove a variable, click the **X** beside its name.
 - f. The summary window shows a summary of the selected data collections, the type of areas that will be enriched, the number of variables selected, and the number of [ArcGIS service credits](#) you'll be charged based on the number of currently selected variables. To add or remove individual variables, expand the data collections, and place a check mark in the boxes beside the variables you want to include.
 - By default, for point layers, data will be returned for a 1-mile radius surrounding each location. To change the radius or to use a drive time or drive distance value instead, click **edit** and make the appropriate changes.
 - Map layers containing polygons will return results for the area within each polygon.
 - g. Click **Add data to system**.
The data variables append to your existing SharePoint list and also display in feature pop-ups on the map.
7. Click **Start workflow** to finish.

If the ArcGIS Maps Locate workflow does not complete successfully, you'll see **Canceled** in the workflow field in the list. Click the link to view more information. Also, see [Frequently asked questions](#) for more information.

Once the ArcGIS Maps Locate workflow successfully completes, the list is ready to be [added to the map](#).

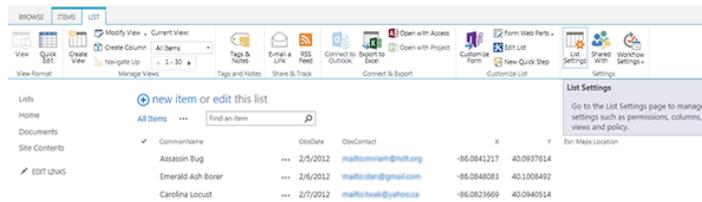
Geocode lists containing coordinate data

SharePoint lists can contain columns that store the geographic location of each item as latitude and longitude. To geocode such lists so they can display on the ArcGIS Maps Web Part, you add and configure a new ArcGIS Location type column in the list; you can then add the list to the ArcGIS Maps Web Part.

Add an ArcGIS Location field to a list

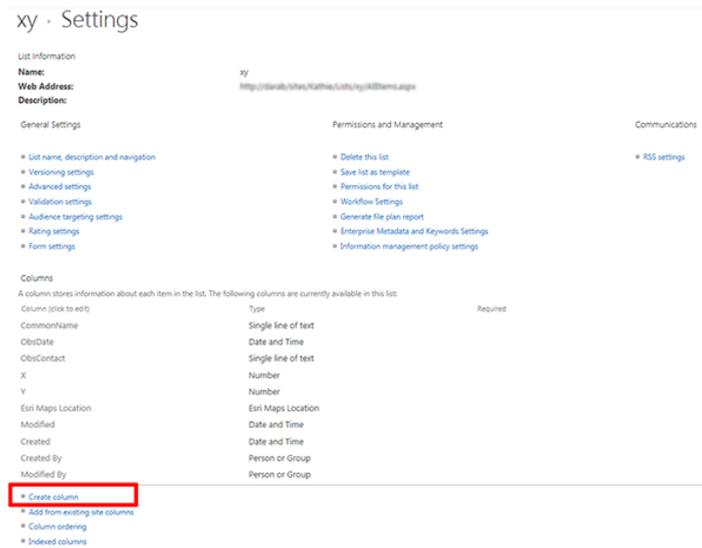
To add an ArcGIS Location field to a list, do the following:

1. Open the list. On the **List** tab, click **List Settings**.



The **List Settings** page appears.

2. Click **Create column** located below the **Columns** section.



The **Create Column** page appears.

Settings · Create Column ⓘ

Name and Type
Type a name for this column, and select the type of information you want to store in the column.

Column name:

The type of information in this column is:

- Single line of text
- Multiple lines of text
- Choice (menu to choose from)
- Number (1, 1.0, 100)
- Currency (\$, ¥, €)
- Date and Time
- Lookup (information already on this site)
- Yes/No (check box)
- Person or Group
- Hyperlink or Picture
- Calculated (calculation based on other columns)
- External Data
- Task Outcome
- Esri Maps Location
- Managed Metadata

Additional Column Settings
Specify detailed options for the type of information you selected.

Description:

Require that this column contains information:
 Yes No

Add to default view

3. Specify a name for the column and click **ArcGIS Maps Location**.
A new section, specific to creating a location field, appears at the bottom of the page.
4. To use a spatial reference other than the standard World Geodetic Survey (WGS) 194, click **Choose spatial reference** and specify the coordinate system to use and click **OK**.

Spatial Column

Choose spatial reference

Choose spatial reference:

- World Geodetic Survey (WGS) 1984 (4326)
- Web Mercator (102100)
- Other:

OK

Geometry type: Unknown

5. From the drop-down menus, choose the fields containing each item's latitude (y-coordinate) and longitude (x-coordinate) using the drop-down menus, and click **OK**.

Spatial Column

Choose spatial reference

Latitude (Y):

Longitude (X):

Shape:

Geometry Type:

6. Optionally specify the default map options.

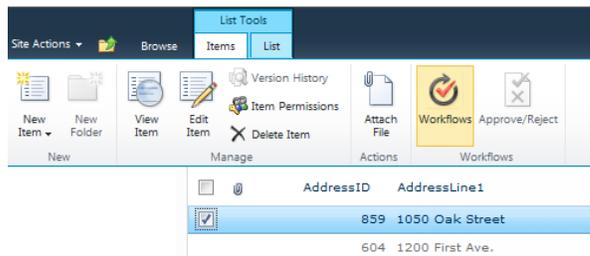
- Zoom width—Specifies the visible area on the map. For example, if the zoom width is set to 2,000 meters, the map would be at country level. If set to 200 meters, the map would display at street level. Can be set in Meters, Feet, Kilometers, or Miles.
 - Search Tolerance—Specifies the radius surrounding the currently selected feature (or center of map extent) that delineates an area for locating addresses. Can be set in Meters, Feet, Kilometers, or Miles.
 - Map Width—Specifies the default width of the map.
 - Map Height—Specifies the default height of the map.
7. Click **OK**.
Once the ArcGIS Location field has been added, the list is ready to be [added to the map](#).

Geocode a single list item

Note: The ArcGIS Online (NA) and ArcGIS Online (EU) geocoders were retired on December 31, 2013. See [Legacy geocoding and routing services at http://tasks.arcgisonline.com](http://tasks.arcgisonline.com) will be retired on December 31, 2013 for more information. Batch geocoding is now available through the [World Geocoding Service](#) included with an ArcGIS Online organizational subscription.

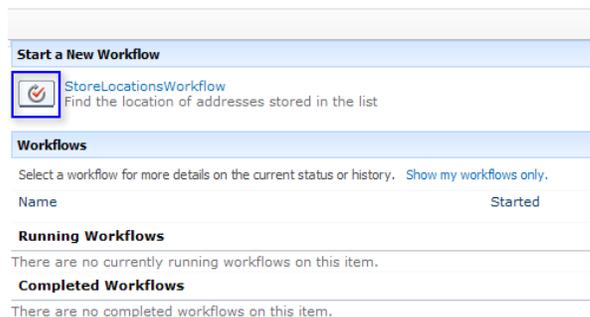
In addition to spatially enabling entire SharePoint lists, the ArcGIS Maps Locate workflow allows you to spatially enable individual list items. To do so, associate the ArcGIS Maps Locate workflow with a list. See [Geocode lists containing address data](#) for more information. You can then run the workflow on an individual list item as follows.

1. Browse to the list and check the check box for the list item to geocode.
2. On the **Items** tab, click **Workflows**.



3. Under the **Start a New Workflow** section, click the button beside the name of the ArcGIS Maps Locate workflow that has been associated with the list.

In the following example, the workflow is named StoreLocationsWorkflow:



When the workflow starts, the list appears in the browser window, and includes a column that shows the workflow's status.

Connect to external data

The ArcGIS Maps Connect workflow supports [external content](#) from Microsoft SQL Server 2008 R2, 2012, 2012 R2, and 2014, including the SQL Server Express editions. The external content must contain data that can be geocoded, such as an address, U.S. city, U.S. state, ZIP code, or world city. The external content must also contain a primary key column. Alternatively, the table can contain an existing [SQL server spatial data type](#) (geography or geometry) column that is then converted by the ArcGIS Maps Connect workflow for use in ArcGIS Maps for SharePoint. If the external table has an existing spatial column that contains no data, the ArcGIS Maps Connect workflow populates the column based on other location information in the table (for example, address). If no spatial column exists, the ArcGIS Maps Connect workflow creates a geography spatial type column named EsriShape with a [Spatial Reference Identifier \(SRID\)](#) of 4326 (WGS 84). The EsriShape field supports all geometries including points, lines, and polygons. In all scenarios, the external content can be enriched with additional geographic data variables from ArcGIS.

 **Note:** If the ArcGIS Maps Connect workflow fails, ensure the appropriate permissions for Microsoft SQL Server have been set. You can view the error messages in the SharePoint site workflow history to view exact details on the settings that need to be corrected.

When the ArcGIS Maps Connect workflow completes, the result is a regular SharePoint list, not an external list. That said, the fields created from the SQL Server database are of an external type, and edits made to these fields in SharePoint cannot be passed back to the database. SharePoint can only pass back the fields it has created, such as for the ArcGIS Maps Locate workflow and geoenrichment.

Prerequisites

Before you can use the ArcGIS Maps Connect workflow, the following prerequisites must be met:

- Credentials for an ArcGIS organizational account must be properly [configured](#) for ArcGIS Maps for SharePoint.
- Microsoft SQL Server 2008 R2, Microsoft SQL Server 2012, Microsoft SQL Server 2012 R2, or Microsoft SQL Server 2014 (including Microsoft SQL Server Express)
- A primary key or unique field in the external table—The ArcGIS Maps Connect workflow requires that the external data source contains a unique field. Ideally, this is a field that is set as the primary key. It is often easiest to add an integer column to your existing table that autoincrements (that is, an Identity column). If a primary key is not or cannot be set, you can use any field that has unique values.
- Communication between the ArcGIS Maps Connect workflow and the external SQL Server tables occurs within the SharePoint web application pool account. This account is used to connect to an external table, and you must set the appropriate permissions on that account to enable the connection. The application pool account is usually a domain account. If, however, the account is a NT AUTHORITY\Network Service account (local built-in account), which is typically the case when the SharePoint is installed using the stand-alone mode, you must grant appropriate permissions for the account. When the NT AUTHORITY\Network Service account is the web application pool account, that account's credentials are used to authenticate connection to the database if the database is hosted in an SQL server that runs on a different server from the one running SharePoint in the same domain (or in a trusted domain). The Network Service account's credentials are in the form `DomainName\SharePointServer$`, where `DomainName` is the domain of your SharePoint server and `SharePointServer` is the name of your SharePoint server. You must grant appropriate permissions for the `DomainName\SharePointServer$` account. Configure the following for the SharePoint web application pool account (or NT AUTHORITY\Network Service or `DomainName\SharePointServer$` account, depending on your environment) and the WSS Content Application Pools database role.
 - Create a server login for the SQL Server instance for the account, if one does not already exist.
 - Map this login to a database user for the database that contains the external table to which you want to connect. Grant the database user the following permissions:
 - `db_datareader`
 - `db_datawriter`
 - `db_ddladmin`
 - Add the following stored procedures to the **securables** list for the **WSS Content Application Pools** database role in the farm configuration database, **SharePoint Config**. Grant the WSS Content Application Pools database role the **execute** permission on those stored procedures:
 - `proc_putObject`
 - `proc_putObjectTVP`
 - `proc_putClass`
 - `proc_getNewObject`

Troubleshooting

The following are some common errors and solutions for resolving them.

- Error—The EXECUTE permission was denied on the object 'proc_putObjectTVP', database 'SharePoint_Config', schema 'dbo'.
Solution—Grant **execute** permission on the procedures stored in the farm configuration database to the **WSS_Content_Application_Pools** database, as described above.
- Error— Access to the path 'C:\ProgramData\Microsoft\SharePoint\Config\xxx\' is denied.
Solution— Grant **full control** permission to the SharePoint web application pool account on the directory in question.

Start the ArcGIS Maps Connect workflow

The first part of the ArcGIS Maps Connect workflow involves creating a connection to your external SQL Server table. You must complete these steps before you can spatially enable (geocode) and geoenrich your list items.

To start the ArcGIS Maps Connect workflow, do the following:

1. Browse to the **Site Contents** page in your SharePoint site collection and click **Site Workflows**.
2. In the **Start a New Workflow** section, click **ArcGIS Maps Connect** to start the workflow.
The ArcGIS Maps Connect workflow page appears.
3. If this is the first time you are using the ArcGIS Maps Connect workflow, choose **Create new** under **Specify the external content type**.
When the workflow completes successfully, the external content type is saved to the site collection, allowing you to reuse the external content type, if necessary. External content types are a key feature of SharePoint's Business Connectivity Services that store descriptions of connectivity information and data definitions.
 - a. Under **Connect to database**, specify whether to connect using a new database connection or an existing database connection (if you have previously completed the workflow). If you are creating a new connection, enter the database server and name and click **Connect**.
For the database server, enter <server name>\<instance>. For the database name, enter the name of the applicable database. You will select a table from the database in the next step.
 - b. Under **Select database table and columns**, use the drop-down menus to specify the database table, primary key column (or unique field), and optionally, spatial column. The spatial column drop-down menu automatically populates if the workflow detects an existing spatial data type (geography or geometry) column in your database.
 - c. Specify a name for the external content type. The information you have completed in the previous steps are saved to an external content type in your site collection with the name you specify here.
4. Specify a name for displaying the connected list in SharePoint.
5. Specify how to locate list items.
 - Use locations from the spatial column—This option is only available if your database table contains a spatial column.
 - Locate items based on information from other columns—Use this option to locate your list items based on an Address, U.S. City, U.S. State, ZIP Code, or World City.
6. Click **Next** to move to the next page of the ArcGIS Maps Connect workflow.

Geocode and enrich your data

The second part of the ArcGIS Maps Connect workflow covers geocoding (spatially enabling) and optionally enriching your data with additional geographic variables. This part of the workflow is identical to the ArcGIS Maps Locate workflow used to geocode existing SharePoint lists.

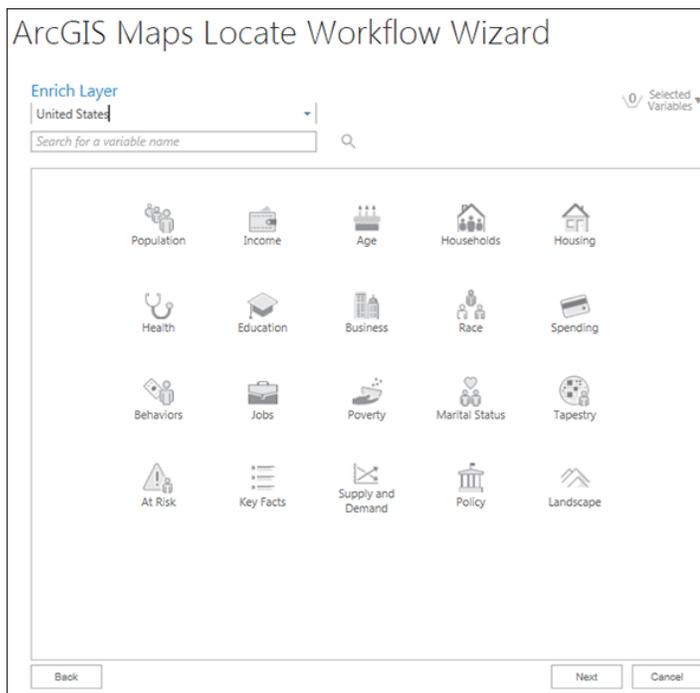
1. Specify how location is represented in your data.
Available choices are: Address, U.S. City, U.S. State, U.S. ZIP Code, World City, and Country.
To [add a custom location type](#), click **Add location type**.
2. Click **Next**.
3. Choose the columns in the list that correspond to the input parameters and click **Next**.
4. Specify which columns to add to the new connected SharePoint list and click **Next**.

5. You can optionally enrich your data with geographic data enrichment variables from ArcGIS. Data enrichment variables are contextual variables available for locations throughout the U.S., Canada, and some countries in Western Europe. Available variables include demographic and socioeconomic factors, age distributions, landscape data, and area wealth information.

Note: Geoenrichment capabilities are supported only with ArcGIS Online, Portal for ArcGIS 10.3 through 10.4.1, and ArcGIS Enterprise 10.5 and later.

To enrich your data, do the following:

- a. Check the **Enrich data** box and click **Next**.
The data enrichment pane opens.



- b. Click the country drop-down menu and choose the country for which you want to see demographics. The list of collections changes depending on the available collections for the selected country.
- c. Optionally, type keywords in the search field to search for specific variables. Press **Enter** or click the magnifying glass to search.
- d. Choose a data collection. You can search for variables within a collection, choose one of the popular variables within the collection, or show all variables in the collection.
- e. Choose the variables you want to add to your list and click **Next**.
Note: The basket icon in the upper right corner of the window shows the number of variables you've chosen. Click the basket to view its contents. To remove a variable, click the **X** beside its name.
- f. The summary window shows a summary of the selected data collections, the type of areas that will be enriched, the number of variables selected, and the number of [ArcGIS service credits](#) you'll be charged based on the number of currently selected variables. To add or remove individual variables, expand the data collections, and place a check mark in the boxes beside the variables you want to include.
 - By default, for point layers, data will be returned for a 1-mile radius surrounding each location. To change the radius or to use a drive time or drive distance value instead, click **edit** and make the appropriate changes.
 - Map layers containing polygons will return results for the area within each polygon.
- g. Click **Add data to system**.
The data variables append to your existing SharePoint list and also display in feature pop-ups on the map.

6. Click **Start workflow** to finish.

Add a location type

You can use a map service or feature service from ArcGIS to specify a location type. For example, if your organization has its own boundaries (water districts, sales districts, or zoning boundaries), you can map your data using those locations instead of the default location types.

You can only add a custom location type in the ArcGIS Maps Locate workflow. See [Prepare SharePoint data](#) and [Geocode lists containing address data](#) for more information.

To add a custom location type, do the following:

1. On the ArcGIS Maps Locate workflow page, click **Add location type**.

2. In the search box, type one or more keywords and press **Enter** to search for the service you want to use as a location type. Click **My organization** to narrow your results.

 **Note:** You can use [advanced keyword searches](#) to narrow your results by specifying how you want to search for an item.

3. Find the service you want and click **Select**.
4. Choose the applicable layer from the service to use to look up locations and click **Next**.

5. Choose the columns that contain the attributes you want to use to look up locations and click **Next**.

6. In the **Name** field, type a name for your custom location type. Optionally type a description in the **Description** field.
7. Click **Add**.
Your location type is added to the list of locations.

 **Note:** If you made a mistake when adding your location type, select it in the list and click **Delete** location type, then start over.

8. On the ArcGIS Maps Locateworkflow page, select your new location type from the list and click **Next**.
9. Choose the columns that contain the location information and click **Next**.
10. Select additional columns of data you would like to add.
11. Click **Start Workflow**.

Fix a location

The ArcGIS Location field provides several options for fixing and updating the location of an individual item, including creating a new marker on the map, moving an existing marker, selecting from similar address matches, and typing an address in the search box.

- Note:**
- If you are using SharePoint 2010 and Internet Explorer, set the AllowSignInOverHttpProxy configuration setting to `True` in the Esri Maps Configuration Settings list. To access this page, type the following URL in your browser's address field: <your site collection root>/lists/esri maps configuration settings.

The ArcGIS Location field shows the map location of the selected item and is automatically added to a list item when you run the ArcGIS Maps Locate. Once the ArcGIS Location field has been added to a list item, you can update the location of existing markers, or add a new marker.

Change a location using the map

To change a location using the map, do the following:

- Browse to your list, select the applicable item, and click **Edit**. The item's fields display, including the ArcGIS Location field.

- Click **Insert a pin** or **Move the point to the desired location** to place the marker in a new location.
- Once you place the marker in the new location, you are prompted to update the address. If you click **Yes**, the map and location information in your item update with the new address information. If you click **No**, the marker stays in the location where placed, but the location information in your item does not change. An example of where it may be useful to click **No** is if you want to leave the address as is but change the location of the marker to represent a specific location, such as a spot on a university campus or hospital.

This step does not apply to items created with workflows that use place-name lookups (for example, World Cities) and custom location types. The pin will update, but a prompt will not appear to update the address information, and the information will remain unchanged.

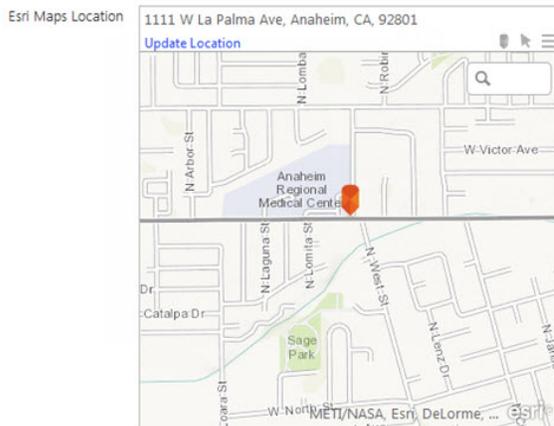
- Click **Save** to save your changes and close the editing window, or click **Cancel** to close the window without saving changes.

Change a location by editing address or coordinate data

The following steps do not apply to items created with workflows that use place-name lookups (for example, World Cities) and custom location types.

To change a location by editing data, do the following:

1. Begin by editing the applicable list item.
2. Edit the values in one or more fields that contain information about an item's location. This can be the item's address information, coordinates, or other.
3. Click **Update Location** in the ArcGIS Location field.



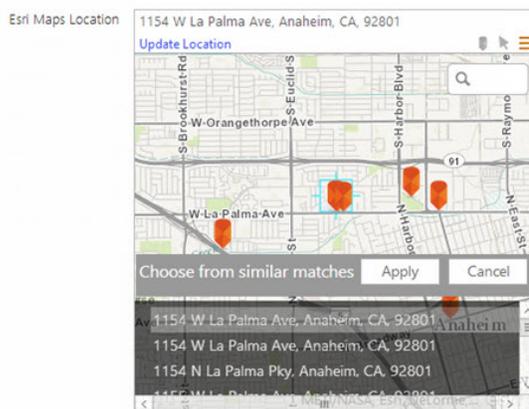
4. Click **Save** to save the new location.

View similar address matches

If the addresses found by the geocoding service are not correct, you can access similar matches and choose from any of those to update your item's location.

To view similar address matches, do the following:

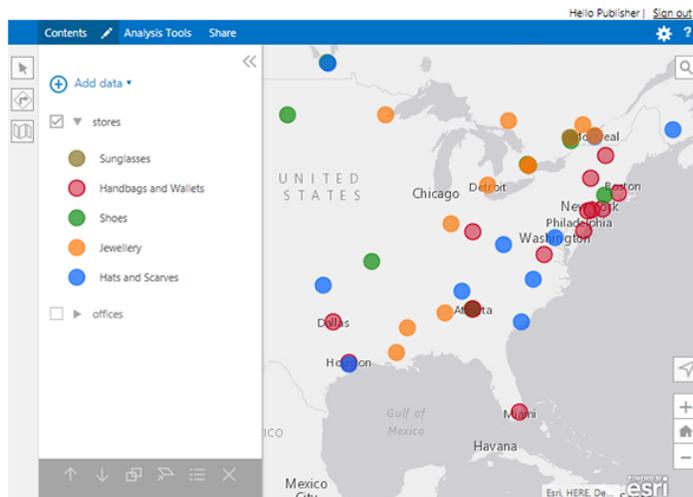
1. Click **View similar address matches** on the ArcGIS Location field.



2. In the list of addresses that appears at the bottom of the map, select the appropriate address and click **Apply**. The ArcGIS Location field and the item's location data updates.
3. Click **Save** to save the new location.

About the ArcGIS Maps web part

The ArcGIS Maps web part is the JavaScript-based web part for ArcGIS Maps for SharePoint. The ArcGIS Maps web part enables a rich display of SharePoint lists, ArcGIS-hosted feature services, and ArcGIS web maps on an interactive map.



With the ArcGIS Maps web part, you can do the following:

- Add web maps and services from ArcGIS, either ArcGIS Online or ArcGIS Enterprise.
- Share maps and layers on ArcGIS for the public or your organization.
- Display SharePoint lists and connect to external data sources via Business Connectivity Services (BCS).
- Connect to List and Chart web parts via web part-to-web part connections.
- Spatially enable (geocode) items in a SharePoint list.
- Interactively configure the map appearance, layers, and other settings.
- Choose from background maps populated by the basemap gallery of your ArcGIS organization.
- Define the appearance of datasets (symbolize) using basic, class breaks, or unique value symbols.
- Display point features using clustering or heat maps.
- Configure the appearance of pop-up windows. Specify the pop-up window style and fields to display when the user hovers over map features.
- View infographics in pop-up windows that provide rich contextual information about the areas surrounding the features in your map.
- Perform route-based analysis of your data.
- Interactively select and filter data within ring-based or drive-time distances.
- Interactively retrieve additional demographic and contextual information associated with mapped locations.

ArcGIS Maps for SharePoint and ArcGIS

With ArcGIS Maps for SharePoint, you can easily create maps that combine your SharePoint data with published geographic content from ArcGIS. You can also share the maps you create in ArcGIS Maps for SharePoint with others within and outside of your organization using ArcGIS. ArcGIS provides an online infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the web.

ArcGIS Maps for SharePoint works directly with your organization's ArcGIS subscription to allow you to access geographic content to enhance your business data. You must be signed in to ArcGIS to use ArcGIS Maps for SharePoint; depending how your administrator has configured the application, you may be prompted to enter your ArcGIS credentials. Your subscription includes a number of service credits, which are the currency of ArcGIS and are used in exchange for most of the ArcGIS services your organization uses. The number of service credits required depends on the type of service you are using. To help you estimate how many service credits you will need, see [Understand credits](#).

With ArcGIS Maps for SharePoint, you can easily [Add data from ArcGIS](#) to your map to help you visualize your data in new ways. Once you have created the desired maps and layers in ArcGIS Maps for SharePoint, you can publish them to ArcGIS for sharing with others.

Sign in to ArcGIS

To use ArcGIS Maps for SharePoint, you must be signed in to ArcGIS.

Sign in

User sign-in allows you to sign in to ArcGIS with your own credentials.

1. Navigate to a map to configure or view it.
2. Click the link to sign in.

The **Sign In** window appears.

 **Note:** If you're using Internet Explorer and the **Sign In** window appears but is blank, try the following:

- a. On the Internet Explorer **Internet Options** dialog box, click the **Security** tab and choose **Trusted Sites**.
 - b. Check **Enable Protected Mode**.
 - c. Click the **Sites** button and add `https://*.arcgis.com`.
 - d. Restart Internet Explorer.
3. In the **Sign In** window, provide your user name and password.
If you do not know your user name or password, contact your administrator.

Edit mode and run mode

Microsoft SharePoint uses web parts to display specific content types on a page of a SharePoint site. Like other web parts within SharePoint, ArcGIS Maps for SharePoint has an edit mode and a run mode. SharePoint users with permissions to edit the page containing the ArcGIS Maps web part can place it in edit mode, while users with read-only permissions can only interact with the map in run mode. Users with contribute permissions in SharePoint can edit an existing map, but users must have design permissions to insert a web part onto a page. See [User permissions and permission levels in SharePoint 2013](#) for more information on SharePoint permission levels.

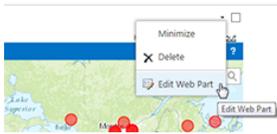
The ArcGIS Maps web part can only save changes when it is in edit mode. This includes signing in, adding and removing layers, and so on. Credentials persist during the current browser session only.

Edit mode

⚠ Caution: Page refreshes occur often during SharePoint web part communication! For example, a page refresh will occur when selecting a feature in one web part and sending that information to another web part. Be aware that a page refresh may cause you to lose changes you've made to the ArcGIS Maps web part. To avoid losing changes, click **Apply** on the **Properties** pane frequently while you're configuring the ArcGIS Maps web part.

To put the ArcGIS Maps web part in edit mode, start by placing the page that contains the map in edit mode. On the SharePoint ribbon, click the **Page** tab and click **Edit**.

Next, click the arrow above the upper right corner of the web part to display the drop-down menu, and choose **Edit web part**.



The ArcGIS Maps web part properties pane appears beside the map.

ArcGIS Maps

Appearance

Title
ArcGIS Maps

Height
Should the Web Part have a fixed height?
 Yes Pixels
 No. Adjust height to fit zone.

Width
Should the Web Part have a fixed width?
 Yes Pixels
 No. Adjust width to fit zone.

Chrome State
 Minimized
 Normal

Chrome Type
Default

Layout

Advanced

OK Cancel Apply

Edit mode allows you to change the web part's configuration settings and save those changes as part of the web part. Configurable portions of the web part include the following:

- Layers, including order and appearance
- Basemap

- Map extent
- Appearance of pop-up windows

To save the web part's configuration, click the **OK** or **Apply** button in the properties pane to the right of the web part.

 **Note:** Your login information will not persist unless the ArcGIS Maps web part is in edit mode. Credentials persist during the current browser session only. In addition, any changes you make to the map will not be saved unless you place the web part in edit mode and save your changes.

Run mode

Users that have read access to the page hosting the ArcGIS Maps web part can use the web part in run mode. In run mode, users can do the following:

- Add or remove layers
- Pan and zoom the map
- Select features
- Share the map

Any changes made in run mode, including adding or removing layers, are not saved in the map.

Change the basemap

A basemap provides a background, or visual context, for the data in a map. For example, a basemap showing streets can provide context for your address data. ArcGIS includes several different types of basemaps for you to use in ArcGIS Maps for SharePoint, including aerial imagery, terrain, streets, and topographic data. The default basemap displayed on the map is determined by your administrator. You can change the basemap at any time to one of the other maps provided.

1. Click the **Basemap** button  on the **Map tools** toolbar to display the basemap gallery.
2. In the gallery, click the desired basemap to select it.
The map automatically displays the new basemap.

 **Note:** The basemaps gallery is populated by the basemap settings of your ArcGIS organization.

Navigate the map

There are several options for navigating the map. You can pan and zoom the map using the mouse, or zoom in and out using the zoom tools.

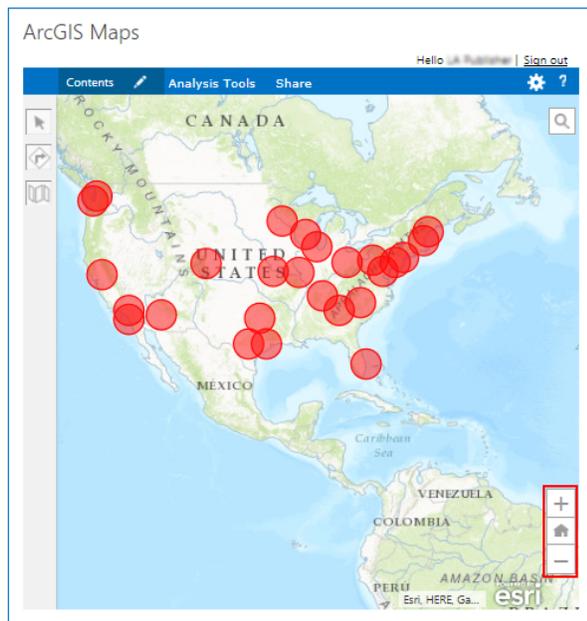
Zoom and pan with the mouse

To begin exploring with your mouse, move the mouse pointer so it is in the middle of the map display. Use the following list as a guide for completing navigation actions with the mouse.

- To move or pan the map, click and drag the map in the direction in which you want it to move.
- To zoom in to a specific area on the map, press the **Shift** key and drag a rectangle to designate the area of interest.
 - 💡 **Tip:** You can also use the mouse scroll wheel to zoom in and out. Rotate the wheel up to zoom in and rotate down to zoom out.
- To zoom out to a specific area on the map, press **Shift+Ctrl** and drag a rectangle to designate the area of interest
- To zoom in on the map at the location of the mouse pointer, double-click on the point of interest.

Zoom in and out using the zoom tools

The zoom in, zoom out, and default extent buttons are shown at the lower right corner of the map and allow you to easily zoom in and out.



To use the zoom tools, do the following:

- Click the **Zoom In** button + to zoom in.
- Click the **Zoom Out** button – to zoom out.
- Click the **Default extent** button 🏠 to zoom to the default extent of the map.

Find address or place

The **Find address or place** tool is located at the upper right corner of the map and allows you to type a place-name or location into the text box and place a symbol on the map in that location.

To find a location, do the following:

- Click the **Find address or place** button 🔍.
- Type in a place-name, address, or coordinates. For example, type *Esri*.
- A list of potential candidate matches appears. Select the one that is the closest match.

- A marker appears in that location on the map. If you typed a generic phrase, such as museum, markers appear on the map based on the center of the map extent, and the map zooms in to those locations.

Add data from ArcGIS

ArcGIS Maps for SharePoint works directly with your organization's ArcGIS subscription, allowing you to search for content within your organization and, if enabled by your administrator, search for public content published by the GIS community, including Esri, and local governments and agencies around the world. Adding data from ArcGIS is a quick way to add content to your map to complement your existing SharePoint data. For example, you may have SharePoint data showing proposed store locations and want to add household income census data from ArcGIS for those areas to visually analyze trends.

With ArcGIS Maps for SharePoint, you can search ArcGIS for [map services](#), [feature services](#), and [web maps](#) to add to your map. Once added, they become layers in your map.

Only layers that are added while the ArcGIS Maps web part is in [edit mode](#) are saved with the map.

1. Sign in to ArcGIS if you are not already signed in.
2. From the **Add data** menu, choose **from ArcGIS**.
3. Search for a layer to add to the map in any of the following ways:
 - Enter one or more keywords and click the **Search** button to search all of ArcGIS. If desired, click **My organization** to narrow your results.
 - Click one of the popular search categories to browse available maps and services from Esri within that category.
 - Enter one or more keywords and click a category to search within that category.
 -  **Note:** The **Show available data in** drop-down menu allows you to show available data for the United States, Canada, and global regions. The option selected by default is the region of the user who is currently logged in. You can select another option from the menu to filter results for both full content and category searches. If you change the region, a new search is performed and the results are displayed immediately.
 - Use advanced keyword searches to narrow your results by specifying how you want to search for an item. To learn how, see [Using search](#).

If your organization's administrator has restricted the ability to search for content outside of your organization, the search only returns results from your organization and the **All results** and **My organization** options will not be visible.

4. Check the **Zoom to data** check box if you want the map to zoom to the full extent of the data you add.
5. Find the service you want and click **Add**.

 **Note:** Depending on the data you add, you may consume ArcGIS service credits. To help you estimate how many service credits you will use, see [Service Credits Overview](#).

A layer containing the data is added to the map and is listed in the **Contents** pane.

 **Note:** If you want more information about the data, click **Details**.

Add data from SharePoint

 **Note:** To add SharePoint lists to your map, the lists must first be spatially enabled (geocoded). To spatially enable lists, see [Geocode lists containing address data](#) and [Geocode lists containing coordinate data](#).

ArcGIS Maps for SharePoint works directly with your organization's SharePoint data, allowing you to use spatially enabled content within your SharePoint site and add it to the ArcGIS Maps web part. Adding data from SharePoint is a quick and easy way to add content to your map to complement your existing SharePoint data. For example, you may have SharePoint data showing proposed store locations to add to your map of household income census data to visually analyze trends.

With ArcGIS Maps for SharePoint, you can add spatially enabled lists containing addresses or place names, or lists containing coordinate data, to your map. Once added, they become layers in your map.

Only layers that are added while the ArcGIS Maps web part is in [edit mode](#) are saved with the map.

1. Place the map in [edit mode](#).
Only layers that are added while the ArcGIS Maps web part is in edit mode are saved with the map.
2. Sign in to ArcGIS if you are not already signed in.
3. From the **Add data** menu, select **from SharePoint**.
A list of spatially enabled SharePoint lists displays. By default, the list includes all geoenabled lists in the current SharePoint subsite.
4. To change the subsite, type the subsite's path in the URL field, or choose a different subsite from the drop-down menu.
5. Expand the list that you want to add to the map and click the **All Items** entry for that list.
You can add several lists at the same time by expanding other lists and checking the appropriate boxes.
6. Click **Add**.
A layer containing the data is added to the map and is listed in the **Contents** pane.

Connect the map to other web parts

The ArcGIS Maps web part allows for connections between the map web part and a List web part. If both are contained on the same page. This functionality is available in SharePoint 2010, 2013, and 2016. In SharePoint 2010, you can also connect to a Chart web part, but due to a [change in SharePoint 2013](#), the Chart web part connection is not available.

Web part communication works by associating a primary key as a connection between a layer in the map contained in ArcGIS Maps web part and a field in a list contained in a SharePoint web part. One web part must be the provider and the other web part is the consumer. This means, for example, that in your map you could have a States layer and connect that to a list of cities. By setting the map web part that contains the States layer as the provider, when you select a state on the map, the list filters to show the cities located in that state. Alternatively, you can set the Cities list web part as the provider, in which case you select a city in the list and the state on the map in which that city is located is selected.

Connections are one to many; therefore, you can only have a single feature selected on the map to display the corresponding items in the list. If you select multiple features in the map, the attribute table displays and you must select a specific feature on the map to filter the list web part. The steps below provide detailed information about configuring the map web part, list web part, and connections.

The ArcGIS Maps web part supports connections to a List web part. You can then select features on the map to filter items in the list, and select features in the list and have them selected on the map. The ArcGIS Maps web part does not provide direct support for filtering a list and having the respective features filtered on the map.

Initial setup

 **Caution:** Page refreshes occur often during SharePoint web part communication. For example, a page refresh occurs when selecting a feature in one web part and sending that information to another web part. Be aware that a page refresh may cause you to lose changes you have made to the ArcGIS Maps web part. To avoid losing changes, click **Apply** on the **Properties** pane frequently while you are configuring the ArcGIS Maps web part.

-  **Note:**
- If you are using a list that was created by importing an Excel spreadsheet, be aware that SharePoint takes the first text column in your spreadsheet and sets that as the title field with a hyperlink to the original spreadsheet (see [SharePoint lists III: Create a list based on a spreadsheet](#)). The ArcGIS Maps web part does not include hyperlinked fields when adding data to the map or in web part communication. This means that you may need to modify your default list view in SharePoint to include the appropriate fields for displaying information in pop-ups and for connecting web parts.
 - To connect ArcGIS Maps to a spreadsheet, you must import it from SharePoint; web part connection will not work with spreadsheets exported to SharePoint from Excel.

The following steps are common to all workflows in which you are connecting the ArcGIS Maps web part to a List or Chart web part.

1. [Add](#) a map to the page.
2. Insert the applicable List or Chart web part on the same page as the ArcGIS Maps web part. The Chart web part is only available in SharePoint Server 2010.
3. Place the ArcGIS Maps web part into [edit mode](#).
4. Click the **Configure** button  to display the configuration options.
5. From the list of configuration options, click **Behaviors** and choose **web part Connectivity Behavior**.
6. Click the **Settings** button  at the top of the panel.
7. Select the applicable layer from the drop-down menu on the **web part Connectivity Connection** panel and click **OK** on each of the panels to close the configuration panel.
8. Click **Apply** on the ArcGIS Maps web part properties to apply the changes.
You must click **Apply** on the ArcGIS Maps web part properties pane to persist the selected layer for web part communication.

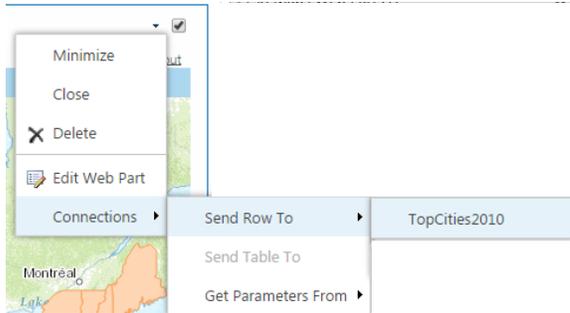
Connections > Send Row To

Prerequisite:

Ensure pop-ups are allowed in your browser for the current SharePoint site; otherwise, the SharePoint **Choose Connections** dialog box will not appear.

In web part communication, setting the ArcGIS Maps web part to **Send Row To** the List web part allows you to select a feature on the map and have the list filtered to show only the selected items. In the workflow below, the map web part that contains the States layer is set as the provider. When a state (feature) is selected on the map, the Cities list filters to show only those cities located in the selected state.

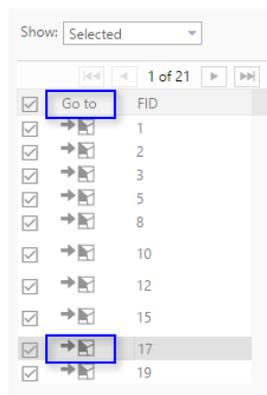
1. With the ArcGIS Maps web part in edit mode, click **Connections > Send Row To > <List>**.



2. On the **Choose Connections** dialog box, you are asked to **Select the connection type for <list>**. Choose **Get Filter Values from** in the drop-down list.

Note: If the **Choose Connections** window does not appear, check that pop-ups are allowed in your browser for your SharePoint site.

3. Next, specify the **Provider** and **Consumer** field names. In this case, the map is the provider, and the list is the consumer. For example, with a Cities list and States layer, you are connecting the Map web part and the List web part using the State field (both the Cities list and States layer have this field).
4. Click **OK** on the ArcGIS Maps web part properties pane to apply changes and stop editing.
5. Click **Save** on the SharePoint page to save the page.
If the page is still editable, selecting features can cause a refresh to occur and currently selected features will be unselected.
6. With the configured page in Run mode, use the **Select tool** in the ArcGIS Maps web part to select features on the map. Connections are one to many; therefore, you can only have a single feature selected on the map to display the corresponding items in the list. If you select multiple features in the map, the attribute table displays and you must select a specific feature on the map to filter the list web part.
 - One feature selected—List web part filters to the corresponding items.
 - Multiple features selected—Attribute table displays and you must click the **Go to** icon to select a single feature to filter the List web part.



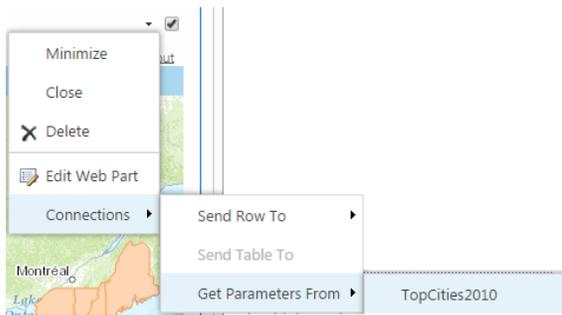
Connections > Get Parameters From

Prerequisite:

Ensure pop-ups are allowed in your browser for your SharePoint site; otherwise, the SharePoint **Choose Connections** window will not appear.

In web part communication, setting the Map web part to **Get Parameters From** the List web part enables you to select an item in the list and have the corresponding item selected on the map. In this workflow, the List web part containing the cities is set as the provider.

1. With the ArcGIS Maps web part in **edit mode**, click **Connections > Get Parameters From > <List>**.



2. On the **Choose Connections** dialog box, specify the **Provider** and **Consumer** field names. In this scenario, the list is the provider and the map is the consumer. For example, with a Cities list and States layer, you connect the Map web part and the List web part using the State field (both the Cities list and States layer have this field).
3. Click **OK** on the ArcGIS Maps web part properties pane to save your changes and stop editing.
4. Select the applicable item in the List web part to filter the items displayed in the ArcGIS Maps web part. You can select only one item at a time. Select the row by clicking in the **Select** column as shown below.

⊕ new item or edit this list

Select	X	Y
<input checked="" type="checkbox"/>	-70.814209	42.889163
<input type="checkbox"/>	-70.897255	42.533483
<input type="checkbox"/>	-71.042237	42.369933
<input type="checkbox"/>	-71.085159	42.301934

5. Click **OK** on the Map web part properties to apply the changes and exit edit mode.

Connect to a Chart web part

Connections from the ArcGIS Maps web part to a Chart web part are only supported in SharePoint 2010 Server.

1. On the Chart web part, click **Data and Appearance** and click **Connect Chart to Data**. The **Connect Chart to Data** wizard opens.
2. Click **Connect to another web part** and click **Next**.
3. Choose the ArcGIS Maps web part and click **Next**.
4. Choose **Table** as the Data Format and click **Next**.
5. Specify the property of the series and the X and Y fields, and click **Finish**. The chart is now configured to display data from the ArcGIS Maps web part.
6. Select features in the ArcGIS Maps web part to display them on the chart. Only selected features display.

Remove the connection

1. To remove a web part connection, place the ArcGIS Maps web part in **edit mode**.
2. On the ArcGIS Maps web part menu, click **Connections > Get Parameters From > <List>** or **Connections > Send Rows To > <List>**, depending on the type of connection you have created. The **Configure Connection** dialog box appears.
3. On the **Configure Connection** dialog box, click **Remove Connection**.

Enrich your data

Mapping your data offers great insight into spatial patterns and allows for quick and easy visual analysis, but there may be times where you would like to obtain contextual information to provide deeper insights about the area surrounding that data. Esri geographic data enrichment capabilities allow you to answer questions about locations that you can't answer with maps alone; for example, What kind of people live here? What do people like to do in this area? What are their habits and lifestyles? What kind of businesses are in this area?

In ArcGIS Maps for SharePoint, you can append geographic data enrichment variables to your existing SharePoint lists when completing the ArcGIS Maps Locate or ArcGIS Maps Connect workflows. Data enrichment variables are contextual variables available for locations throughout the U.S., Canada, and some countries in Western Europe. Available variables include demographic and socioeconomic factors, age distributions, landscape data, and area wealth information.

As part of the ArcGIS Maps Locate and ArcGIS Maps Connect workflows, you can optionally choose to add these data variables while completing the workflow.

1. Check the **Enrich data** check box and click **Next**.

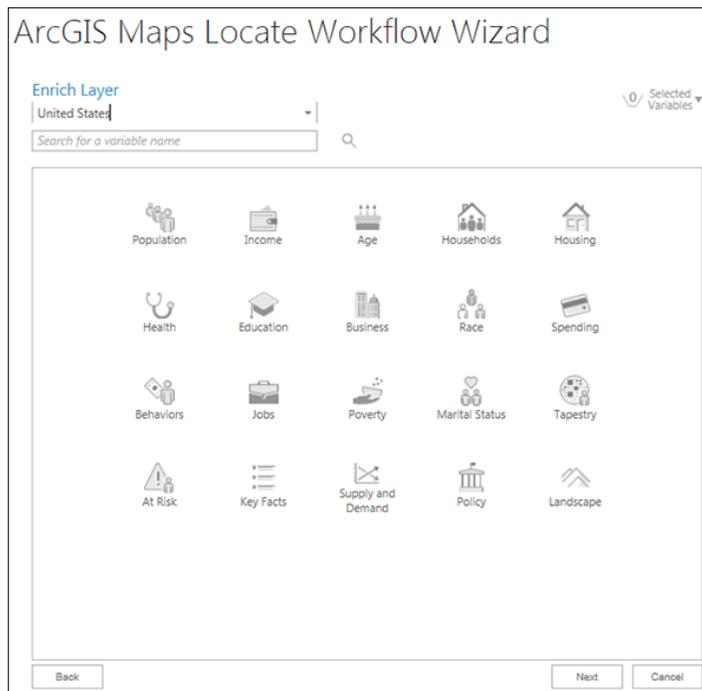
Esri Maps Locate

You can optionally enrich your SharePoint and external data with demographic, lifestyle and other location-based information (e.g. Average household income, age).

Enrich data

Next

2. Click the applicable data collection to move to the variables panel.



3. Check the check box beside the applicable variables for the data collection and click **Next**.
4. Review the data enrichment summary showing the distance parameters for retrieving data and the total number of ArcGIS [credits](#) consumed. By default, data variables are retrieved for a one-mile circle around each feature location. To change the radius to use a drive time or drive distance instead of a circle, click the **edit** link.

Esri Maps Locate

Selected Variables: 2014 Median Household Income (Esri), ...

Show data for: 1 mile circle around locations ([edit](#))

Variables per Row: 2 (NaN)

Variable Name
<input checked="" type="checkbox"/> 2014 Income (Esri)
<input checked="" type="checkbox"/> 2014 Median Household Income
<input checked="" type="checkbox"/> 2014 Average Household Income

5. Click **Add data to system**. The data variables are appended to your existing SharePoint list and also display in feature pop-ups on the map.

Feature display and style

With ArcGIS Maps for SharePoint, you can style your data on the map using different symbols, colors, and sizes to appropriately represent the features. For example, you may want to use different public safety symbols to denote locations of police and fire stations, or use different colors or sizes of a symbol to show locations of major cities according to the population.

When you add data from your business system to the map, ArcGIS Maps for SharePoint creates a layer that appears on the **Contents** pane and draws the data on the map using a default style. The style can be changed using the options on the **Style** pane.

How layers are drawn

The **Style** pane allows you to draw a layer as follows:

- With a single symbol or color—Draw the features in a layer using the same symbol or color.
- With different colors—Divide your data into groups and show each with a different color.
- With different-sized symbols—Divide your data into groups and show each with a different size.

For layers containing point features, there are two different types of symbols you can use to style your data: icons and shapes.

- **Icons**—Standard, Business and Facilities, Public Safety, Transportation, People and Places, Public Safety and Health, and Outdoor Recreation
- **Shapes**—Circles, Crosses, Diamonds, Squares, and Xs

For layers containing polygon features, you can style your data using different colors.

If you [Add data from ArcGIS](#) that contains line features, you can change the style of the line features by choosing from different line types and colors and changing the line thickness.

For more information, see [Style points](#), [Style lines](#), and [Style polygons](#).

Grouping methods

If you decide to style a layer using either different colors or different-sized symbols (for point features only), you will be asked how you want to group your data and what field (or attribute) to use to group it. If you choose to group your data by categories, your data will be grouped and styled based on a common value for the field (or attribute) you chose for grouping (for example, business types such as retail or wholesale).

If your layer has numeric fields, you can choose to group your data by number ranges. For this grouping option, you must choose a classification method. Each classification method takes your data and divides it into classes (groups). Classification method options include Equal Interval, Natural Breaks, and Quantile. The value at which a feature is placed into a different class is often referred to as a class break. The way in which class breaks are determined by each grouping method is discussed below.

Equal Interval

With the Equal Interval classification method, the range of all of your data values are divided into equal-sized subranges. With Equal Interval classification, you specify the number of intervals (or subranges), and ArcGIS Maps for SharePoint automatically determines how to divide the data. For example, if you specify three classes for a field whose values range from 0 to 300, ArcGIS Maps for SharePoint creates three classes with ranges of 0–100, 101–200, and 201–300. Equal Interval is best applied to familiar data ranges, such as percentages and temperature. This method emphasizes the amount of an attribute value relative to other values. For example, it shows that a store is part of the group of stores that make up the top one-third of all sales.

Natural Breaks

Natural Breaks classes are based on natural groupings inherent in the data. Class breaks that best group similar values and maximize the differences between classes are identified. The features are divided into classes whose boundaries are set where there are relatively big differences in the data values. Natural Breaks classification is good for mapping data values that are not evenly distributed as it places clustered values in the same class.

Quantile

In Quantile classification, each class contains an equal number of features (for example, 10 per class or 20 per class). A quantile classification is well suited to linearly distributed data. It is useful when you want to emphasize the relative position of a feature among other features—for example, to show that a store is in the top quarter of all stores by sales. Quantile classification assigns the same number of data values to each class. There are no empty classes or classes with too few or too many values. Because features are

grouped in equal numbers in each class using quantile classification, the resulting map can often be misleading. Similar features can be placed in adjacent classes, or features with widely different values can be put in the same class. You can minimize this distortion by increasing the number of classes.

Change a layer's style

In ArcGIS Maps for SharePoint, layers are drawn on the map using a default style. You can change a layer's style to any of the styles shown in the **Style** pane. The style currently applied to a layer is shown in the **Contents** pane when you expand the layer by clicking the arrow . For more information, see [Feature display and style](#).

1. On the **Contents** pane, click the **Settings** button to the right of the layer for which you want to change the style.
2. Click **Style**.
3. To configure style properties, do one of the following:
 - To style a point layer, see [Style points](#).
 - To style a line layer, see [Style lines](#).
 - To style a polygon layer, see [Style polygons](#).

The map automatically updates to reflect the style changes you made.

4. Click **OK**.

 **Note:** You can quickly change the basic style of an individual layer directly from the **Contents** pane. Click the arrow () to expand the layer contents, and click the symbol you want to modify. Depending on the layer type, different options are available. For lines and polygons, choose a new color for the shape. For point features, choose a different icon from the drop-down menu, or, if the layer was styled using shapes, choose a new color.

Style points

When you add data from SharePoint to a map, ArcGIS Maps for SharePoint creates a layer and displays the data using a default style (symbol). These layers, and certain layers added from ArcGIS, can be styled using different icons or shapes, colors, and grouping.

One way to style a point layer is using a single symbol to represent all of the features in the layer. Another way is to divide the point features into groups and style each group with a different color. Alternatively, if your data has numeric fields, you may choose to style each group with a different-sized symbol. For example, you may want to use different point colors or sizes to show retailers classified by profit.

As you modify the style options for your layer, the map automatically updates to reflect your settings.

For more information on styling layers, see [Feature display and style](#).

Use a single symbol

1. On the **Contents** pane, click the **Settings** button to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **No** for **Style by column**.
3. You can use an icon or a shape to style a point layer. Do one of the following:
 - To style the layer with an icon, choose the icon you want to use. To see additional icons, click the drop-down arrow, click a desired category, and choose the icon you want.
 - To style the layer with a shape, click the **Shapes** arrow. Choose the shape and color you want.
4. Use the **Size** slider to specify the desired size for the icon or shape. The map automatically updates to reflect the style options you specified.
5. Click **OK**.

Use different colors

1. On the **Contents** pane, click the **Settings** button to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column**.
3. If the column you chose does not contain numeric data, do the following:
 - a. Click the **Symbol** drop-down arrow, click **Shapes**, and choose the shape you want.
 - b. From the **Color scheme** drop-down menu, choose the desired colors.
 - c. Optionally, change the color for any of the individual categories as needed.
 - d. Skip to step 9.
4. If the column you chose contains numeric data, click the **Group column values by** drop-down arrow and do one of the following:
 - Choose **Number ranges** to classify values into groups by numeric order and assign a group style.
 - Choose **Categories** to assign a style to each unique value.

 **Tip:** If your data contains a column that has a URL to a specific icon you want to use to style your point layer, choose **Categories** from the **Group column values by** drop-down menu, and then choose the appropriate column from the **Choose column with icon Url** drop-down menu.
5. If you chose **Number ranges** from the **Group column values by** drop-down menu, do the following:
 - a. Click the **Symbol** drop-down arrow, click **Shapes**, and choose the shape you want.
 - b. Under **Style using**, click **Colors** and choose the color you want.
 - c. Click the **Classification method** drop-down arrow and choose the desired grouping method. For additional information on each of these methods, see [Feature display and style](#).
 - d. Using the **Number of groups** slider, specify the number of groups to use for the data. You can have between two and seven groups.
 - e. Choose the desired colors from the **Color ramp** drop-down menu. Check the **Reverse colors** check box to reverse the colors in the selected color ramp. The default color ramps cannot be changed or edited.
6. If you chose **Categories** from the **Group column values by** drop-down menu, do the following:
 - a. Click the **Symbol** drop-down arrow, click **Shapes**, and choose the shape you want.

- b. Choose the desired colors from the **Color scheme** drop-down menu.
- c. Optionally, change the color for any of the individual categories as needed.

 **Note:** If you turn on the **Clustering** option for a layer styled using shapes grouped by category, clusters will display as pie charts at the appropriate zoom level. Pie chart clustering is available only for shapes; clusters for layers styled using symbols will display as a solid circle. For more information, see [Configure clustering](#).

7. Use the **Size** slider to specify the desired size for the shape.
8. Click **OK** when finished.
Your style settings are displayed on the map. For point layers, you may have to turn off clustering to see individual point symbols.

Use different-sized symbols

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column**.
3. Click the **Choose column to group** drop-down arrow and choose a column containing numeric data.
4. Click the **Group column values by** drop-down arrow and choose **Number ranges**.
This classifies values into groups by numeric order and assigns a group style.
5. Click the **Symbol** drop-down arrow and do one of the following:
 - To style your data with an icon, choose a category and choose the icon you want.
 - To style your data with a shape, click the **Shapes** arrow and choose the shape you want to use.
6. You will have a **Style using** choice if you are styling a shape. Click **Sizes**. If you are styling an icon, you will not see this option.
7. Click the **Classification method** drop-down arrow and choose the desired grouping method.
For additional information on each of these methods, see [Feature display and style](#).
8. Using the **Number of groups** slider, specify the number of groups to use for the data. You can have between two and seven groups.
9. Use the **Minimum and Maximum Sizes** slider to specify the start and end (minimum and maximum) sizes for the symbols.
10. Click **OK** when finished.
Your style settings are displayed on the map. You may have to turn off clustering to see individual point symbols. See [Configure clustering](#).

Style lines

When you add data from SharePoint to a map, ArcGIS Maps for SharePoint creates a layer and displays the data using a default style. These layers, and certain layers added from ArcGIS, can be styled using different symbols, colors, and grouping.

One way to style a line layer is using a single line symbol to represent all of the features in the layer. Another way is to divide the line features into groups and style each group with a different color. Alternatively, if your data has numeric fields, you may choose to style each group with a different-sized line. For example, you could use different line colors or sizes to show roads classified by traffic volume.

As you modify the style options for your layer, the map automatically updates to reflect your settings.

For more information on styling layers, see [Feature display and style](#).

Use a single line symbol

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **No** for **Style by column?**
3. From the **Line** drop-down menu and select the type of line you want.
4. Select a color for the lines.
5. Move the **Thickness** slider as desired to set the thickness of the lines.
6. Click **OK**.

Use different colors

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column?**
3. If the column you chose does not contain numeric data, do the following:
 - a. From the **Line** drop-down menu, select a line type.
 - b. From the **Color scheme** drop-down menu, select the desired colors.
 - c. Optionally change the color for any of the individual categories as needed.
 - d. Skip to step 9.
4. If the column you chose contains numeric data, click the **Group column values by** drop-down arrow and do one of the following:
 - Select **Number ranges** to classify values into groups by numeric order and assign a group style.
 - Select **Categories** to assign a style to each unique value.
5. If you chose **Number ranges** from the **Group column values by** drop-down menu, do the following:
 - a. From the **Line** drop-down menu, select a line type.
 - b. Click the **Classification method** drop-down arrow and select the desired grouping method. For additional information on each of these methods, see [Feature display and style](#).
 - c. Using the **Number of groups** slider, specify the number of groups to use for the data. You may have between two and seven groups.
 - d. Choose the desired colors from the **Color ramp** drop-down menu. Check the **Reverse colors** check box to reverse the colors in the selected color ramp. The default color ramps cannot be changed or edited.
6. If you chose **Categories** from the **Group column values by** drop-down menu, do the following:
 - a. From the **Line** drop-down menu, select a line type.
 - b. Select the desired colors from the **Color scheme** drop-down menu.
 - c. Optionally change the color for any of the individual categories as needed.
7. Move the **Thickness** slider as desired to set the thickness of the lines.
8. Click **OK** when finished.

Use different-sized lines

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.

2. Click **Style**. Specify **Yes** for **Style by column?**
3. Click the **Choose column to group** drop-down arrow and select a column containing numeric data.
4. Click the **Group column values by** drop-down arrow and select **Number ranges**.
This classifies values into groups by numeric order and assigns a group style.
5. From the **Line** drop-down menu, select a line type. From the color selector, choose a color for the lines.
6. Under **Style using**, click **Sizes**.
7. Click the **Classification method** drop-down arrow and select the desired grouping method.
For additional information on each of these methods, see [Feature display and style](#).
8. Using the **Number of groups** slider, specify the number of groups to use for the data. You may have between two and seven groups.
9. Use the **Minimum and Maximum Sizes** slider to specify the start and end (minimum and maximum) sizes for the symbols.
10. Click **OK** when finished.

Style polygons

When you add SharePoint data to a map, ArcGIS Maps for SharePoint creates a layer and displays the data using a default style. These layers, and certain layers added from ArcGIS, can be styled using different symbols, colors, and grouping.

One way to style a polygon layer is using a single color to represent all of the features in the layer. Another way is to divide the polygon features into groups and style each group with a different color. For example, you might want to use different colors to denote sales territories classified by revenue range.

As you modify the style options for your layer, the map automatically updates to reflect your settings.

For more information on styling layers, see [Feature display and style](#).

Use a single color

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **No** for **Style by column?**
3. Select a color for the polygon features.
4. Click **OK**.

Use different colors

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column?**
3. If the column you chose does not contain numeric data, do the following:
 - a. From the **Color scheme** drop-down menu, select the desired colors.
 - b. Optionally change the color for any of the individual categories as needed.
 - c. Skip to [step 7](#).
4. If the column you chose contains numeric data, click the **Group column values by** drop-down arrow and do one of the following:
 - Select **Number ranges** to classify values into groups by numeric order and assign a group style.
 - Select **Categories** to assign a style to each unique value.
5. If you chose **Number ranges** from the **Group column values by** drop-down menu, do the following:
 - a. Click the **Classification method** drop-down arrow and select the desired grouping method. For additional information on each of these methods, see [Feature display and style](#).
 - b. Using the **Number of groups** slider, specify the number of groups to use for the data. You may have between two and seven groups.
 - c. Choose the desired colors from the **Color ramp** drop-down menu. Check the **Reverse colors** check box to reverse the colors in the selected color ramp. The default color ramps cannot be changed or edited.
6. If you chose **Categories** from the **Group column values by** drop-down menu, do the following:
 - a. Select the desired colors from the **Color scheme** drop-down menu.
 - b. Optionally change the color for any of the individual categories as needed.
7. Click **OK** when finished.

Customize the map contents

Show and hide the Contents pane

When you add data to your map, the data appears as one or more layers listed in the **Contents** pane. When you want to work with the layers in your map—for example, toggle layer visibility, style your data, [configure clustering](#), and so on—you can display the **Contents** pane and access your layers of data. You can hide the **Contents** pane at any time when you want a full view of the map.

1. To show the **Contents** pane, click the **Contents** tab.
2. To hide the **Contents** pane, click the **Hide map contents** icon.

Depending on the size of the map, the **Contents** pane and controls may be displayed slightly differently.

Toggle a layer's visibility

The **Contents** pane lists all layers available to display in the map. By default, ArcGIS Maps for SharePoint displays all available layers. Using the check box beside each layer name, you can specify which layers to display and which ones to hide from view, making it easier for you to work with features on the map. For grouped styles, you can also hide individual groups as desired.

1. In the **Contents** pane, do one of the following to define a layer's visibility:
 - To show the layer on the map, check the check box beside the layer name. By default, all available layers are visible (selected).
 - To hide the layer from the map, uncheck the check box. Items on the specified layer are no longer displayed on the map.
2. You can also toggle the visibility of individual groups:
 - a. Click the plus sign (+) beside the layer name to expand the layer contents. The **Contents** pane displays the styling applied to the selected layer. If the features in the layer are styled by group, the **Contents** pane shows the styling of all the groups.
 - b. Click in the center of the row for the group you want to hide. Text identifying the group turns light gray, and the specified group is hidden in the map.
 - c. Click on the group again to restore its visibility.

Rename a layer

Layers that you add to the map can be renamed in the **Contents** pane. When you first add a layer, the layer name is determined by the layer's data source. When you change the layer name in the **Contents** pane, only the display name of the layer is changed; the name in the underlying data is not affected.

1. In the **Contents** pane, click the layer name to highlight it.
2. While the layer name is highlighted, type the new layer name.
3. Click outside the text area to finish.

Change the order of layers

The order in which layers are listed in the **Contents** pane represents how layers are drawn on the map. Within the map, the layers listed at the top draw over those listed below them, and so on, down the list. You can easily move layers in the **Contents** pane to adjust their drawing order.

 **Note:** The order of heat map layers and map service layers added from ArcGIS cannot be changed.

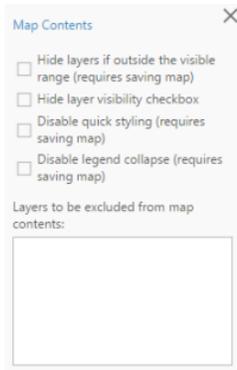
1. In the **Contents** pane, click the desired layer in the **Contents** pane to highlight it.
2. Use the **Move layer up**  and **Move layer down**  buttons at the bottom of the **Contents** pane to move the selected layer to the desired order.

Configure the Map Contents pane

The **Map Contents** pane is a central component of the ArcGIS Maps web part. The **Map Contents** pane displays the list of layers contained in the map, and you can use it to toggle layer visibility on and off. By default, the pane also shows the symbols used for each layer.

 **Note:** The Map Contents **Edit** feature is available only when the ArcGIS Maps web part is in [edit mode](#).

Map Contents configuration options include specifying which layers to include in the Map Contents, whether to allow end users to change layer visibility, and the ability to show only the layers visible at the current scale.



- The **Map Contents** pane displays the list of layers contained in the map, and you can use it to toggle layer visibility on and off.
- To configure the **Map Contents** pane, place the ArcGIS Maps web part in [edit mode](#).
- Click the **Edit** icon at the top of the Contents pane.
- Enable an option by checking the option's check box. Clear the check box to disable the option.
- Click **Save**.

Duplicate a layer

Sometimes, you may want to use the same data in your map but style it differently. You can make a copy of any layer in the map and style it as desired.

1. In the **Contents** pane, click the layer you want to copy to highlight it.
2. Click the **Duplicate layer** button  to create a copy of the selected layer. The new layer appears at the top of the layer list in the **Contents** pane. The new layer is named using the same name as that of the original layer, with the word **Copy** appended to it.

You can [rename](#) the new layer and [style](#) it as desired.

Remove a layer

Any layer that you add to the map can be removed.

1. On the **Contents** pane, select the layer you want to remove.
2. Click the **Remove layer** button  at the bottom of the **Contents** pane.
3. When a confirmation message appears, click **Yes**.
The layer is removed from the map and is no longer listed in the **Contents** pane.

View layer details

For layers you have added from ArcGIS or layers you have shared on ArcGIS, you can access information about the item on ArcGIS. The information associated with the layer may include a description, access use and constraints, tags, [credits](#), size, and extent.

1. On the **Contents** pane, select the desired layer.
2. Click the **Layer details** button  at the bottom of the **Contents** pane.

If the **Layer details** button isn't enabled, the selected layer does not have information accessible from ArcGIS

The ArcGIS details page for the layer opens in your default web browser. If you are viewing the details for a layer that is not shared publically, you are prompted to log in to ArcGIS

Zoom to a feature

You can get detailed geographic information about a feature layer in your map by viewing the layer's attribute table. An attribute table includes information about each geographic feature in the layer. You can zoom to a feature in your map by clicking the corresponding record in the attribute table.

 **Note:** Zooming to features is only available for [feature service](#) layers.

1. Select a feature on the map. See [Select features on the map](#).
2. Under **What do you want to do with your selection?**, click **View selected records**. Attribute information for the selected features appears in an attribute table.
3. In the attribute table, find the record corresponding to the feature to which you want the map to zoom.
4. Click the icon in the **Go to** column for the record.
The map zooms to the feature and the feature flashes briefly.

 **Tip:** If pop-ups are turned on for a layer, you can zoom to a feature in the layer by clicking the feature on the map and click the **Zoom to** icon on the pop-up. To learn how to configure pop-ups, see [Configure and display pop-ups](#).

Zoom to the full extent of a layer

You can zoom the map to display all the features of a layer.

1. Select the layer in the **Contents** pane.
2. Click the **Zoom to extent** button  at the bottom of the **Contents** pane. The map automatically zooms to display all the features in the layer.

Zoom to the combined area of layers

You might want your map to automatically zoom to display the combined area of specific layers each time it's loaded in a SharePoint site. You can turn on this behavior using the **Zoom on load** setting on each of the layers you want to include in the combined zoom area.

1. Click the **Contents** tab to display the **Contents** pane.
2. In the **Contents** pane, click the settings icon to the right of one of the layers you want to include in the combined zoom area.
3. Click **Zoom on load** to turn on this setting for the layer.
4. Repeat these steps for any other layers you want to include in the combined zoom area.
Each time the SharePoint site opens, the map will automatically zoom to show the combined area of all the layers for which the **Zoom on load** setting was turned on.

Change layer display

Set the visible range of a layer

As you configure or view your map, you may find it appropriate to limit the levels at which layers display. These levels, or thresholds, allow you to specify that, for example, certain layers should only display when you zoom to the level of a neighborhood or city, or that a layer only displays when you zoom to the level of an entire region or country.

Setting the visible range of a layer can be particularly useful for ensuring that only the relevant data is displayed when zooming in and out to different levels on the map. For example, you may have a layer showing the locations of parks throughout a city. It would be appropriate to display the layer at a city level but not at a continent level. In this scenario, you would set the city level to be the maximum threshold at which the layer displays. As you zoom out past the city level, the parks layer no longer displays. Alternatively, your map may have state boundaries that only need to be shown at the country level but not when you have zoomed in closer to the city or neighborhood levels. In this scenario, you would set the minimum threshold of the state boundaries layer to country so that as soon as you zoom in past that level, the layer no longer displays. In other words, with a minimum threshold of country, the state boundaries layer only displays when you have zoomed out to the country level.

1. Click the **Contents** tab to display the **Contents** pane.
2. On the **Contents** pane, click the settings button to the right of the layer for which you want to set the visible range.
3. Click **Visible range** to display the visible range settings.
4. Move the Minimum and Maximum sliders as desired.
5. Click **OK**.

As you zoom in and out on the map, the layer displays only within the visible range you specified.

Set layer transparency

You can configure the transparency of layers in the map. This allows you to see more or less of certain layers so you can emphasize specific data.

1. Click the **Contents** tab to display the **Contents** pane.
2. On the **Contents** pane, click the settings button to the right of the layer whose transparency you want to set.
3. Use the **Transparency** slider to specify the desired setting. A layer with 0 percent transparency has no transparency applied. A layer with 100 percent transparency is not visible in the map.

 **Tip:** You can also set the transparency by entering a value in the box beside the slider.

Filter a layer

Filtering a layer provides a means of asking questions about the features of a feature service you have added to the map. When filtering a layer, only the features that meet the criteria specified by the filter are shown on the map. For example, you may want to specify a filter on a layer to display graffiti complaints within a specified district or city. In the ArcGIS Maps Web Part, you can filter a feature service so that only the features that meet the filter criteria are shown. To filter a layer, see the following steps:

1. Click the **Contents** tab to open the **Contents** pane.
2. Select the feature service to be filtered.
3. Click the **Settings** button to the right of the layer name to open the layer menu.
4. Click the **Filter layer** button to bring up the **Filter layer** pane.
5. Create an expression under **Match the following expression** by changing the drop-down boxes and radio buttons to create your query. For more information on filter expressions, see [Building a query expression](#).
 - Click **Add another expression** to add additional expressions on which to filter.
 - Click **Add a set** to create a query containing AND or OR in the expression.
6. Click **Apply** to update the layer.
The map is updated with the data matching the query set in the **Filter layer** pane.
7. Alternatively click the **Clear** button to reset the expression back to the default.
8. Click **Close** to exit from the **Filter layer** pane.

Auto refresh a layer

Layers on your map can be configured to update based on a certain time interval. Auto refresh requeries the data underlying a layer and allows you to automatically see changes when layer or table contents have changed. You can enable updates based on a specified time interval. Auto refresh can be enabled on feature layers, web maps, and SharePoint list layers.

To turn on auto refresh, complete the following steps:

1. Click the **Contents** tab to open the **Contents** pane.
2. Choose the layer to auto refresh.
3. Click the **Settings** (gear icon) button beside the layer name to open the **Layer options** pane.
4. Click **Auto refresh** to display the **Auto refresh** pane.
5. Click the **On/Off** selector under the **Layer** drop-down box to turn on auto refresh.
The **Interval in minutes** section appears under the **On/Off** selector.
6. Type a time interval in minutes or use the arrows to increase or decrease the time interval.
7. Click **OK** to exit the **Auto refresh** pane.

Configure and display pop-ups

Configure pop-ups

Pop-ups contain descriptive information about the features in each layer in the map. A pop-up displays a header (title) and attribute information based on the columns and rows in your data. Pop-ups display when you click a feature on the map. You can change the way information is presented in the pop-up by changing the header and specifying the fields to display.

Some layers from ArcGIS do not support configuring pop-ups. In these instances, the pop-up option will not be available on the layer's context menu.

To configure a pop-up, complete the following steps:

1. In the **Contents** pane, click the settings button to the right of the layer for which you want to configure pop-ups.
2. Click **Pop-ups** to display the Pop-ups pane.
3. Click the **On/Off** selector below the **Layer** drop-down box to turn on pop-up display. The **Configure pop-ups** section appears below the **On/Off** selector.
4. From the **Header** menu, select the field you want to display as the header (title) of the pop-up.
5. Below the **Header** menu, each field in your data is listed. Check or uncheck the check box beside each field to specify the information you want to display in the pop-up.
6. Click **OK** when finished.

When you click a feature on the map, the newly configured pop-up displays. click the **Zoom to** icon on the pop-up to zoom to the selected feature.

If you're displaying the pop-up on a SharePoint list layer, click the **Go to item** icon on the pop-up to open a new tab in your browser displaying the SharePoint List item attributes for the current feature item.

 **Note:** The **Attributes** and **Infographics** options on pop-ups are persistent, meaning that the last selected button determines what is displayed in subsequent pop-ups. For example, if you view infographics in a pop-up and close the pop-up, all other pop-ups will automatically display infographics for selected features. Because viewing infographics consumes ArcGIS [service credits](#), it is good practice to revert to the **Attributes** display before closing the pop-up.

You can generate a report containing demographic data surrounding the selected feature on the map. Click the **Report** icon at the lower right of the pop-up to open the report window. For details, see [Create reports](#).

Set up attachments

If you're displaying a SharePoint list layer, click the **Show item attachment** icon on the pop-up to open a list of hyperlinks to the available attachments for the item. Click the hyperlink to open the attached item.

To set up attachments in your SharePoint list, complete the following steps:

1. Browse to and click the desired list.
2. Highlight the item you which you want to add an attachment.
3. Right-click the item and click **Edit Item**.
4. Click **Attach File** on the ribbon.
5. Click **Browse** and browse to the file you want to attach.
6. Click **Open** and click **OK** to exit the attachments page.
7. Click **Save** to save your changes and exit the **Edit Item** page.
8. Click the **List** tab on the SharePoint List ribbon.
9. Click **Modify View** to modify the list's view.
10. Check attachments.
This will allow the **Show item** attachment icon to display on the pop-up by default.
11. Click **OK** to exit the **Modify View** page.

Edit features

Editing in ArcGIS Maps for SharePoint includes the ability to add and delete features, change feature geometries and attributes, and add attachments. Editing is available for feature layers that have been made editable by the original author. If a feature layer is editable, it is automatically enabled for editing in ArcGIS Maps for SharePoint.

In addition to editing features, you can also edit [Map Notes](#) if they were included in the original web map. Edits to map notes are not pushed back to the original web map; they are saved in the ArcGIS Maps for SharePoint map only.

 **Caution:** There is a known issue with Microsoft SharePoint where hovering over the Format Text and Insert tabs on the ribbon causes a refresh of the page. Editing while the ArcGIS Maps web part is in edit mode can cause this issue to occur more frequently. Therefore, it is recommended that you perform all edit tasks while the ArcGIS Maps web part is in run mode.

Configure editing

Editing can only be configured if there are editable feature layers or map notes (from a web map) in the map.

Editing is available in both run mode and edit mode.

 **Note:** Add Features must be explicitly added to the ArcGIS Maps web part in order to enable all the editing capabilities described in this document.

1. Edit the page and place the ArcGIS Maps web part in [edit mode](#).
2. From the ArcGIS Maps web part menu, click the **Configure** button  to display the configuration pane.
3. From the list of configuration options, click **Tools**, and click **Map tools**.
4. Click the **Add** icon (+) at the top of the pane.
5. Expand the **esriMapsSharePointX** category to display available tools.
6. Check the **Add features** check box and click **Add**.
The **Add features** tool appears in the list of **Map tools**.
7. Highlight the **Add features** tool and click the **Settings** button at the top of the pane.
8. In the **Configuration** pane, select the layers to edit. Only layers that support editing are shown here. If you select the option to edit all feature layers, editing will automatically be enabled on any layers added to the map that support editing. By default, **Edit all editable feature layers** is enabled.
9. Check the box beside any of the editing options you want to enable and click **OK**.
The **Advanced Editing Tools** section contains tools intended for users with advanced editing scenarios. The **Advanced Editing Tools** items appear on the **Edit toolbar**.
10. Click **OK** to exit the **Configuration** pane.
11. Click **OK** on the ArcGIS Maps web part properties to save your changes and exit edit mode.
12. **Save** your page.

Add features

1. Open the **Add features** pane from the **Map Tools** toolbar.
2. Choose an icon in the **Add features** pane and click on the map to add the feature.
3. Update the appropriate attributes in the **Add features** pane and click **Apply**.
4. Alternatively, you can delete features when the attributes are displayed by clicking the **Delete** button.

Delete features

Delete features

1. Ensure pop-ups are enabled for the desired feature layer.
2. Click a feature to display its pop-up.
3. Click the **Edit attributes** icon in the pop-up's toolbar.
4. Click the **Delete** button.
5. Click **Yes** to confirm you want to delete the feature.
The feature is now permanently deleted from the feature layer.

Edit features

Edit features

Editing of feature geometry and attributes is available on the feature's pop-up menu.

1. Ensure pop-ups are enabled for the desired feature layer.
2. Click a feature to display its pop-up. The edit geometry and edit attributes icons display in the pop-up's toolbar.

Select features on the map

Selecting features on a map provides a way to identify, locate, and visually analyze a set or subset of data on the map. Once you have made a selection on the map, you can find features that are near your selection, view detailed information about the selected features in an attribute table, deselect certain features, or clear all selections.

1. From the **Map tools** toolbar, choose **Select**.
2. From the **Choose a layer** drop-down menu, select the layer containing the features you want to select.
3. Do any of the following to make selections:

-  **Note:**
 - For point features, only features that are completely within the selection area are included in the selection.
 - To pan the map while making selections, use the **Pan** tool.
 - Click the **Rectangle** selection tool and drag on the map to draw a rectangle to select the features you want.
 - Click the **Free-hand** selection tool and drag on the map to draw a freehand shape to select the features you want.
 - To select a single feature, click the feature on the map while either of the selection tools are enabled.

Continue to draw shapes or click individual features to select more features as needed.

-  **Note:** If your map has point features that have been clustered, you will not be able to select the clustered features on the map. You can turn off clustering to select the individual point features. See [Configure clustering](#).

4. To clear all selections or remove part of your selection, do one of the following:
 - Click the **Remove from selection** tool and drag on the map to draw a rectangle around the features you want to remove from the selection.
 - Click the **Clear selection** tool to clear all selections in the layer.
5. Specify whether to use the selected features to View selected records, Find Nearby, or Get Route.
6. To find features in other layers in your map that are near your selection, click **Find nearby** and do the following:
 - a. Click the **What do you want to find** drop-down arrow and select a layer.
 - b. Click **Ring** to search within a specified distance around the selection, or click **Drive time** to search within a specified drive time of the selection.
 - c. If you chose **Ring**, specify a radius in either miles or kilometers. If you chose **Drive time**, specify the maximum drive time from the selection in minutes or hours.
 - d. Click **Find**.

If you chose **Ring**, ArcGIS Maps for SharePoint generates a new temporary layer containing the circles that define the search radius. The features encompassed within that radius are selected on the specified layer.

If you chose **Drive time**, ArcGIS Maps for SharePoint generates a new temporary layer containing the polygons that define the search area. The features encompassed within those polygons are selected on the specified layer.

The search area for each **Find nearby** action is generated as a temporary layer in the **Contents** pane, using the name of the original layer with a prefix indicating the name of the related action, for example, **Find nearby buffer - LayerName**. You can use these layers as reference for future select actions.

-  **Note:** These layers are temporary and are not saved with the map.

7. To view detailed attribute information about the features you selected, click **View selected records** on the **Select** pane. Attribute information for the selected features appears in an attribute table.

-  **Tip:**
 - You can select additional features from this table to add to your selection. click the **View** drop-down arrow and select **All**. Check the boxes for the records corresponding to the additional features you want to add to the selection. The features are selected on the map.
 - You can use the attribute table to zoom to a specific feature in the map. See [Zoom to a feature](#).

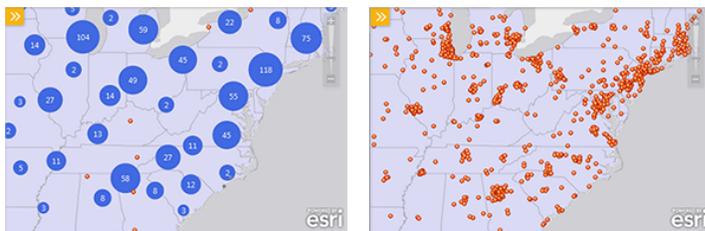
8. Click **Get route** if your selected point features are destinations and you want to find the best driving route to reach them. See [Find a driving route](#) for more information.

Configure clustering

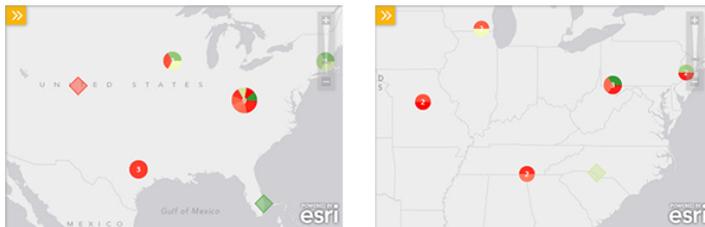
When a layer contains a large number of point features, showing each feature individually on the map is often not useful. In this scenario, point features often overlap, making it difficult to distinguish between features. Even when they do not overlap, it is usually difficult or impossible to visually extract meaningful information when hundreds or thousands of points are shown all at once.

One approach to resolving this issue is to group point features within a certain distance of one another on-screen into one symbol. This is known as clustering. Since the clustering is dependent on screen distance, more points are aggregated into fewer groups as you zoom out. Conversely, points are divided into more and more groups as you zoom in. When you zoom to a level where the clustering area around one point feature no longer contains any other features, that feature will not be clustered but rather will be shown in its location with the styling specified by the layer.

Clusters are interactive; when you click on a cluster, each individual point feature in the cluster appears on the map. The cluster's pop-up contains a separate page for each feature; use the forward and back arrows in the pop-up's title bar to scroll through pop-ups for each feature. Although you cannot change the default style of a single cluster, you can change the basic color that applies to all clusters and the color of the text that appears within a cluster. In the screen captures below, the image on the left displays the points with clustering enabled, and the image on the right does not have clustering enabled.



If you styled a point layer using shapes grouped by category, the clusters will display a pie chart showing the ratio of different categories within that cluster. As you zoom in, the cluster is divided into smaller groups and the pie chart changes to reflect the information in the new cluster.



1. On the **Contents** pane, click the settings icon to the right of the point layer for which you want to configure clustering.
2. Click **Cluster points**.
3. Click the **On/Off** selector under the layer to turn on clustering for the layer.
The map automatically displays the default properties for clustering symbols for the layer.

 **Note:** To turn off clustering, click the **On/Off** selector again.

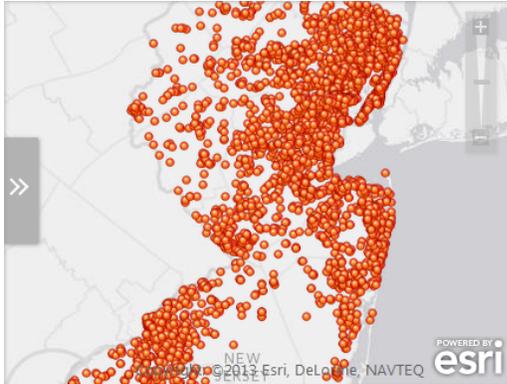
4. Do any of the following to configure clustering for the layer:
 - To change the distance at which points will be grouped together in a cluster, use the - or + buttons or enter a new pixel value between 0 and 50 in the **Cluster radius** box.
 - To change the color of the text on the cluster symbols, click the **Cluster number color** drop-down menu and select a new color.
 - To change the color of the cluster symbol, click the **Cluster color** drop-down menu and select a new color.

The map automatically updates to reflect the new cluster settings.

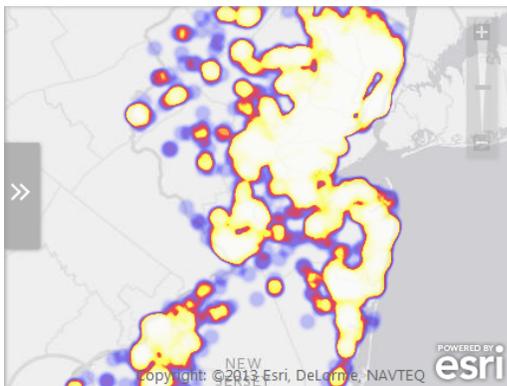
5. Click **OK** when you are finished.

Add a heat map

When a layer contains a large number of point features, showing each feature individually on the map is often not useful. In this scenario, point features often overlap, making it difficult to distinguish between features. Even when they do not overlap, it is usually difficult or impossible to visually extract meaningful information when hundreds or thousands of points are shown all at once.



One approach to resolving this issue is to create a heat map. A heat map represents the geographic density of point features on a map by using colored areas to represent those points. The areas will be largest where the most points are concentrated.



Note: Heat map layers and layers that are clustered cannot be shared to [ArcGIS](#) as a layer, but they can be shared as part of a map. In the map viewer on ArcGIS.com, the heat map layer displays as a point layer instead of rendering as a heat map.

1. Click the **Contents** tab to display the **Contents** pane.
2. On the **Contents** pane, click the **settings** icon to the right of the point layer for which you want to configure a heat map.
3. Click **Heat map**.

Note: The **Heat map** item will be disabled if **Clustering** is turned on. You must first turn off clustering before applying and configuring a heat map.

4. Click the **On/Off** selector under the layer to turn on the heat map for the layer.

Note: To turn off clustering, click the **On/Off** selector again.

5. Click **Heat map**.
6. To change the way the heat map appears on the map, from the **Contents** pane, click the arrow to the right of the heat map layer and click **Configure heat map**.
7. To change the way the heat map appears on the map, do any of the following to configure it:
 - Choose a color scheme from the **Color scheme** menu.
 - Adjust the intensity of the heat map using the **Radius** slider or by typing a number between 10 and 100 in the text box beside the radius slider.

8. Click **OK** when you are finished.
A new heat map layer appears in the **Contents** pane. The map automatically displays the heat map under the original points layer.

Find hot spots

Even random spatial patterns exhibit some degree of clustering. In addition, our eyes and brains naturally try to find patterns even when none exist. Consequently, it can be difficult to know if the patterns in your data are the result of real spatial processes at work or just the result of random chance. This is why researchers and analysts use statistical methods like Find Hot Spots (Getis-Ord G_i^*) to quantify spatial patterns. When you do find statistically significant clustering in your data, you have valuable information. Knowing where and when clustering occurs can provide important clues about the processes promoting the patterns you're seeing. Knowing that residential burglaries, for example, are consistently higher in particular neighborhoods is vital information if you need to design effective prevention strategies, allocate scarce police resources, initiate neighborhood watch programs, authorize in-depth criminal investigations, or identify potential suspects.

 **Note:** Hot spot analysis is currently only available with connections to ArcGIS Online organizations. Hot spot analysis with ArcGIS Enterprise is coming at a future release.

1. Click the **Contents** tab to display the **Contents** pane.
2. On the **Contents** pane, click the point layer you want to analyze.
3. Click **Analysis Tools > Find hot spots**.
4. In the **Hot spot analysis** pane, select the layer in the drop-down list.
5. Under **Find hot and cold spots**, choose how you want the analysis to be performed.
 - Choose by point densities to perform the analysis based on the points in the layer.
 - Choose by attribute values to perform based on an attribute value of the layer. Use the drop down to select the attribute value you want to use
6. To restrict the analysis to the map area displayed in the viewer, check the **Restrict analysis to the map's current map extents** check box. To apply the analysis to the entire map, uncheck the check box.
7. In the **Result layer name** field, type a name to assign to the new layer.
8. Check the **Save the results** check box if you want the results to be saved.
9. Click **Run analysis**.

When the analysis is complete, a new layer is created and appears in the **Contents** pane. For the points or the areas in this result layer, the darker the red or blue colors appear, the more confident you can be that clustering is not the result of random chance. Points or areas displayed in beige, on the other hand, are not part of any statistically significant cluster; the spatial pattern associated with these features could very likely be the result of random chance. Sometimes the results of your analysis will indicate that there aren't any statistically significant clusters at all. This is important information to have. When a spatial pattern is random, there are no clues about underlying causes. In these cases, all of the features in the results layer will be beige. When you do find statistically significant clustering, however, the locations where clustering occurs are important clues about what might be creating the clustering. Finding statistically significant spatial clustering of cancer associated with certain environmental toxins, for example, can lead to policies and actions designed to protect people. Similarly, finding cold spots of childhood obesity associated with schools promoting after-school sports programs can provide strong justification for encouraging these types of programs more broadly.

For technical details on how the Hot Spot tool works, see [How Hot Spot Analysis \(Getis-Ord \$G_i^*\$ \) works](#).

For more information about spatial statistics, see [How Optimized Hot Spot Analysis Works](#).

 **Note:** You cannot change the styling properties of a hot spot layer.

Find a driving route

About finding a route

It is often necessary to analyze your data to answer questions such as the following:

- What is the quickest way to get from point A to point B?
- How can a fleet of delivery or service vehicles improve customer service and minimize transportation costs?
- Which branch of a store should a potential customer visit to minimize travel time?

ArcGIS Maps for SharePoint can help you find the best way to get from one location to another or visit multiple locations. The best route is the shortest route that minimizes travel time. If you have more than two stops to visit, ArcGIS Maps for SharePoint can determine the best sequence in which to visit the locations. This is called route optimization.

ArcGIS Maps for SharePoint uses specialized services from ArcGIS—the route service and the World Geocoding Service—to find an optimal driving route. Your data can come from ArcGIS or from SharePoint.

 **Note:** The route service and the World Geocoding Service work in all [supported countries](#). One or more countries are grouped together to form a region. The route service does not support requests that span more than one region. Consequently, a route will be found only between those stops that are in the same region as the first stop. You can easily find a driving route by specifying two or more destinations in your point layer. Once ArcGIS Maps for SharePoint [finds the best route](#) using the destinations you specified, you can zoom to the full route or print out driving directions.

 **Note:** Using this functionality consumes [ArcGIS](#) service credits. To help you estimate how many service credits you will use, see [Service Credits Overview](#).

Find a route

You can easily find a driving route by specifying two or more destinations in your point layer using any of the following methods:

- Selecting destinations on your map using a selection tool
- Specifying a destination by adding a pin
- Manually entering addresses

When ArcGIS Maps for SharePoint finds the best route using the destinations you specified, you can zoom to the full route or print out driving directions.

To find a route:

1. From the **Map tools** menu, click **Get route**.
The **Get Route** pane appears.
2. Specify the destinations you want to include in your route using any of the following methods:
 - Click the **Select** tool and click and drag a rectangle on the map to select the points you want to use as destinations. Your map must contain points to select.
 - Click the **Drop pin** tool and click a point on the map to add it as a destination. The destination is added as the first stop.
 - Click the **Enter an address** tool and type an address in the empty destination box.

You can repeat any of these methods until all destinations have been specified.

3. Do any of the following to make changes to your destinations:
 - To remove a destination from the route, click the small **x** beside the destination. The **x** icon appears only when your route contains more than two destination points. When the route consists of only two points, the **Reverse directions** icon appears beside the addresses.
 - To switch the start and end destinations, click the **Reverse directions** icon to the right of the destination list.
 - To rearrange three or more destinations, hover over the letter icon (A, B, C) until the icon changes to a four-directional arrow. Click and drag the destination field to the desired location in the list of destinations.
 - To change the location of a stop on the map, click the icon on the map and drag it to a new destination; the new address is updated in the address field.

 **Note:** You can move destination points on the map after generating the original route; click **Get route** again to update the driving route after you move a destination point.

- If you want ArcGIS Maps for SharePoint to determine the best sequence in which to visit four or more specified destinations, check the **Optimize order** check box. When optimizing a route, the first and last stops are fixed, and the intermediate stops are optimized.

4. When you're finished specifying destinations for your route, click **Get route**.

 **Note:** Using this functionality consumes [ArcGIS](#) service credits. To help you estimate how many service credits you will use, see [Service Credits Overview](#).

The route is displayed on the map. Information about the route, including route length (miles or kilometers) and estimated driving time, appears under the list of destinations.

 **Tip:** To see the entire route displayed on the map, click **Zoom to full route**.

5. To view and print driving directions for the route, click the **Print** icon, and click **Print** on the directions page that appears. Modify the print settings as needed and click **Print**.

The resulting printout consists of a map that contains the route and the stops.

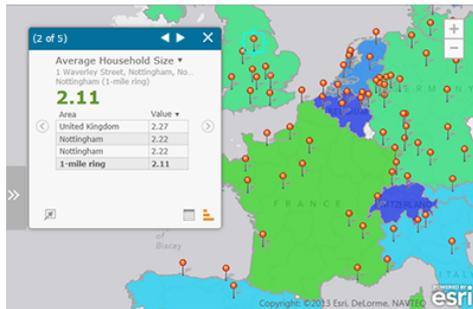
6. To clear the route, close the **Get route** pane.

View and configure infographics

Infographics are visualizations that provide rich contextual information about the areas surrounding the features in your map. When you press the **Infographics** button in a pop-up, ArcGIS aggregates the demographics around that feature on your map and delivers them using easy-to-understand Infographics that contain information such as age distribution and income for a set distance around the selected location. The information contained in Infographics is available while the pop-up is open and is not saved to your business system.

 **Note:** Using this functionality consumes [ArcGIS](#) service credits. To help you estimate how many service credits you will use, see [Service Credits Overview](#).

In the image below, an Infographic shows the average household size within a one-mile radius of the selected city. Many Infographics are interactive; hover over elements in the Infographics or use the **Forward** and **Back** arrows to display additional information.



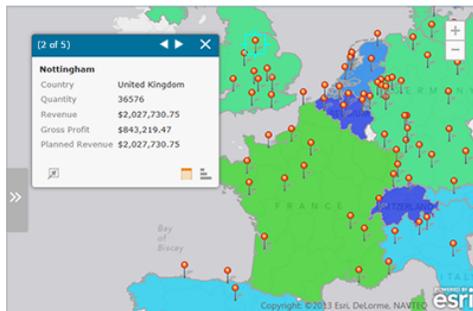
To view a more detailed Infographic, click the **Maximize** button in the pop-up's title bar. Click **Restore** to return the window to its original size.



Click the **Previous** and **Next** arrows on the **Infographics** window to scroll through available feature visualizations.

Click the **Zoom to** button to zoom in to the selected feature.

Click the **Attributes** button to display the feature's attributes list.



Note: The **Attributes** and **Infographics** options on pop-ups are persistent, meaning that the last selected button determines what is displayed in subsequent pop-ups. For example, if you view Infographics in a pop-up and then close the pop-up, all other pop-ups will automatically display infographics for selected features. Because viewing infographics consumes ArcGIS [service credits](#), it is good practice to revert to the **Attributes** display before closing the pop-up.

Configure infographics

Information is displayed in a carousel of configurable infographics. Each infographic shows the distribution of one variable around the chosen location. A few infographics are turned on by default and can be scrolled through by clicking the arrows beside the infographic. Infographics can be configured to display specific data collections and for specific distances.

1. Edit the page and place the map in [edit mode](#).
2. From the ArcGIS Maps web part menu, click the **Configure** button  to display the **Configuration** pane.
3. From the list of configuration options, click **Tools**, then click **Popup tools** and choose **Infographics**.
4. Click the **Configure** button (gear icon).
The **Configure Infographics** pane opens.
5. Click the **Show available data for** drop-down list, and choose the country for which you want to view infographics variables.

6. Choose whether you prefer to use the **Light** or **Dark** theme by clicking the **Select color theme** drop-down list.
7. Choose which data collections should appear in the carousel.
 - Check the boxes beside the infographics you want to see. Uncheck the boxes for the infographics you don't want to see.
 - Click **Add more variables** to explore the data collections available from the ArcGIS platform.
 - Choose a data collection to see which variables are contained within it.
 - Check the variables you want to see in your infographics carousel.
 - Click **Back** to return to the **Configure Infographics** window.
8. Define the area for which you want information.
 - Choose either **Ring** or **Drive Times** to define the type of area around the selected feature. A ring will return information from a circle around the selected feature. Selecting **Drive Times** will return information from an area within a driving distance from the selected feature.
 - Choose the distance from the selected feature for which you want demographic information. By default, demographic information will be gathered for an area 1-mile in all directions from the selected object. This ring can be changed to different linear distances. If **Drive Times** was chosen in the previous step, you have the option of choosing distance in units of linear measurement (miles or kilometers) or time (minutes).
9. Click **OK** to save your changes.

Create reports

Reports can be created for a location or point on the map and saved in PDF or Excel formats. Reports can be generated to include values for a distance of rings or drive distance or within a drive time. There are 20 different reports that provide information about the area of your choice. Reports include Demographic and Income Profile, Executive Summary and Retail Goods, and Services Expenditures. These reports can be used to describe and gain a better understanding about the market, customers and clients, and competition associated with your area of interest. Once created, reports can be shared and sent to others.

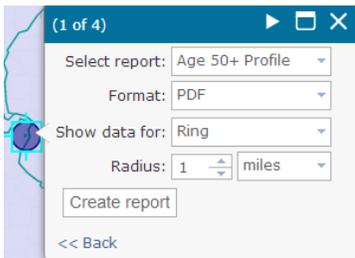
 **Note:** Using this functionality consumes [ArcGIS](#) service credits. To help you estimate how many service credits you will use, see [Service Credits Overview](#).

You can create reports for a feature on the map. Features can be rivers, roads, pipelines, buildings, counties, and political subdivisions, as well as points, lines, and polygons. Any data that you add is also added as a feature on the map.

1. Click a feature on the map to display the pop-up to access reports.



2. Click the **Create report**  icon.
The dialog box appears where you can set the parameters for the report you want to create.



3. Click the **Select report** drop-down arrow to select the report you want to run.
4. Click the **Format** drop-down arrow to select the format for your report. You can choose from PDF or Excel.
5. Click the **Show data for** drop-down arrow for rings, drive times, and drive distance.
6. Select the radius and units for your report.
7. Click **Create report**.
The report icon appears at the bottom of the page. Click to open the report.

Measure distances and areas

You can easily measure distances and areas on your map using the **Measure** tool. The **Measure** tool allows you to draw a single-segment or multisegment line to measure a linear path, or a shape to measure a specific area. You can also use the **Measure** tool to find the coordinates of any point on the map. You can also change the default units of measurement while you use the tool.

Add the Measure tool to the ArcGIS Maps web part

You must add the **Measure** tool to the ArcGIS Maps web part before you can use it.

1. Edit the page and place the ArcGIS Maps web part into [edit mode](#).
2. Click the **Configure** button  to display the configuration options.
3. From the list of configuration options, click **Tools** and choose **Map tools**.
4. Click the **Add** button (+) from the top of the panel.
5. Expand the **esriMapsSharePointX** category to display available tools.
6. Check the **Measure** check box and click **Add**.
The **Measure** tool appears in the list of Map tools.
7. Click **OK** to exit the configuration options.
8. Click **OK** on the ArcGIS Maps web part properties to save your changes and exit edit mode.
9. **Save** your page.

Measure a distance

Measure distances on the map by drawing a line to specify a linear path.

1. On the **Map tools** toolbar, click the **Measure** tool.
2. Click the **Distance** button .
3. Click two or more points on the map to draw a line. When you are finished drawing, double-click to complete the line. The result of your distance measurement appears at the bottom of the **Measure** tool.

 **Note:** Depending on the distance and location of your measurement, the line you drew may be curved. This is because the **Measure** tool must take into account the natural curvature of the earth to calculate the shortest path between two points. The curve you see is called a geodesic curve. Lines and shapes drawn using geodesic curves more accurately represent length, direction, and position everywhere on the surface of the earth.

4. To change the distance units, choose a new unit of measurement from the drop-down menu. The measurement result updates to reflect the new units.
5. To measure another distance, click on the map and draw a new line. The new line replaces the previous measurement line on the map, and the measurement result updates to reflect the new distance.

Measure an area

Measure areas on the map by drawing a shape to specify an area.

1. On the **Map tools** toolbar, click the **Measure** tool.
2.  Click **Area**.
3. Click three or more points on the map to draw a shape. Double-click to complete the shape. The result of your area measurement appears at the bottom of the **Measure** tool.

 **Note:** Depending on the distance and location of your measurement, the line you drew may be curved. This is because the **Measure** tool must take into account the natural curvature of the earth to calculate the shortest path between two points. The curve you see is called a geodesic curve. Lines and shapes drawn using geodesic curves more accurately represent length, direction, and position everywhere on the surface of the earth.

4. To change the area units, choose a new unit of measurement from the drop-down menu. The measurement result updates to reflect the new units.
5. To measure another area, click on the map and draw a new shape. The new shape replaces the previous measurement shape on the map, and the measurement result updates to reflect the new area.

Display coordinates for a point

Display longitude and latitude coordinates for a point on the map by clicking a specific location.

1. On the **Map tools** toolbar, click the **Location** tool.
2. Click the map at the location for which you want to get coordinates. The coordinates of the point appear at the bottom of the **Measure** tool.
3. To change the units, choose a new unit of measurement from the drop-down menu. Choose from Decimal Degrees or Degrees, Minutes, Seconds (DMS). The result updates to reflect the new units.
4. To view coordinates for another location, click a different point on the map. The result updates to reflect the new location.

Pan the map while measuring

You may find that what you want to measure is not completely contained within the current extent of the map; for example, a street or parcel may extend beyond what is visible.

To move the map as you're measuring, while still maintaining the cumulative total distance or area, hold down the left mouse button (or the equivalent navigation) and drag to pan the map in the direction you want. Resume measuring by clicking the map with the left mouse button.

Close the Measure tool

Close the **Measure** tool by clicking the **Close (X)** button on the tool.

When you close the tool, all measurement graphics are cleared from the map.

Share a layer on ArcGIS

Sharing your ArcGIS Maps for SharePoint layers to ArcGIS is a quick and easy way to share information with others in your organization or in the [ArcGIS](#) public community. You can share individual layers or the [entire map](#).

When you share a layer, a hosted [feature service](#) is created on ArcGIS, where you can do more work on it.

 **Note:** You can only share layers to ArcGIS if you are signed in with an organizational account that has publisher permissions. If you are unsure of your account permissions, contact your ArcGIS subscription administrator.

Only layers that have been created with ArcGIS Maps for SharePoint can be shared. You cannot share layers to ArcGIS that you've added using the Search function.

1. Sign in to ArcGIS if you are not already signed in. For more information, see [Sign in to ArcGIS](#).
2. Click the **Contents** tab to display the **Contents** pane.
3. In the **Contents** pane, click the **Settings** icon to the right of the layer you want to share.

 **Note:** [Heat map](#) layers cannot be shared to ArcGIS as layers but can be shared as part of a map. In the map viewer on ArcGIS.com and ArcGIS Explorer Online, the heat map layer displays as a point layer instead of rendering as a heat map.

If you want to share a layer with [clustering](#) applied, the layer is shared as a point layer without clustering.

4. Click **Share layer**. Note that publishing may take several minutes depending on the amount of data in your layer. **Share layer** will only be visible if you've selected a layer that can be shared on ArcGIS. Layers you create with data from your business system can be shared on ArcGIS. Layers you've added using the **Search** cannot be shared.

Once the map has published successfully, a message appears telling you it has successfully published. Click **OK** to close the message.

 **Note:** You can update the layer and republish it on ArcGIS by clicking **Update shared map** under the settings icon next to the shared layer and modify the information you entered as needed.

5. Specify a title, tags, and a description for the layer and choose whether to share it with everyone (public), your organization, or any groups to which you belong.
6. Click **Share**.

Share a map to ArcGIS

Sharing a map created in ArcGIS Maps for SharePoint to ArcGIS is a quick and easy way to share information with others in or outside of your organization. When you share a map, a web map is created on ArcGIS, where you can do more work on it.

If the map you're sharing contains layers created from SharePoint data, these layers will represent a snapshot of the current SharePoint data in the shared map.

 **Note:** You can only share a map to ArcGIS if you are signed in with an organizational account that has publisher permissions and if sharing has been enabled by your organization's administrator. If you're unsure of your account permissions, contact your ArcGIS subscription administrator.

1. Sign in to ArcGIS if you are not already signed in. For more information, see [Sign in to ArcGIS](#).
2. Click the **Share** menu and click **Share map**.
3. Specify a title, tags, and description for the map and choose whether to share it with everyone (public), your organization, or any groups to which you belong. These fields are used to display information about the map on ArcGIS and are also used for searching.
4. Click **Share** to share the map to ArcGIS as a web map. Note that publishing may take several minutes depending on the amount of data in your map.
Once the map has published successfully, a message appears at the bottom of the **Contents** pane along with a link to view the shared map on ArcGIS.

 **Note:** You can update the map and republish it to ArcGIS by clicking **Update shared map** under the **Share** menu and modifying the information you provided as needed.

5. Click the link at the bottom of the **Contents** pane to view the published map. The web map details page opens in ArcGIS. The details page displays the title, tags, and description that you provided.
6. Click **Open** to open the map in the ArcGIS.com map viewer, ArcGIS Explorer Online, or, if installed, ArcGIS for Desktop.

Print a map

The ArcGIS Maps web part provides printing capabilities for your application. The **Print Map** tool prints exactly what is displayed in the map. You must configure your map before clicking **Print Map**, as there are no configuration options (such as zooming or panning) on the print screen.

The print layout includes the following:

- The map's current visible extent
- All copyright and attribution information, shown below the map

The print layout does not include the following:

- An overview map
- Scalebar
- Description

ArcGIS Maps for SharePoint supplies the text's font and the printed map's layout. The map is drawn using the same resolution as shown on the screen and therefore may not display properly if scaled to a larger map display. The location and scaling of the map cannot be adjusted.

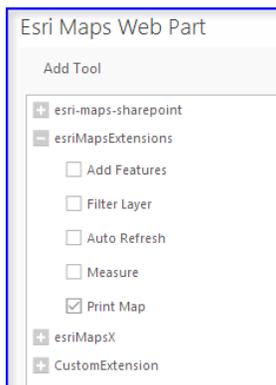
Using the standard Windows **Print** dialog box, you can choose the following:

- The printer to use
- The paper size
- Whether to print in landscape or portrait layout

Add the Print Map tool to the ArcGIS Maps web part

To add the Print Map tool to your application, follow these steps.

1. Edit the page that contains the map and place the ArcGIS Maps web part in [edit mode](#).
2. From the ArcGIS Maps web part menu, click **Configure**  to display the **Configuration** pane.
3. Select the area in which you want to place the tool. For example, choose **Map tools**.
4. Click the **Add** button (+), expand **esriMapsSharePointX**, and check the **Print Map** check box. Click **Add**.



The **Print Map** tool appears in the list of map tools.

5. Click **OK** to close the **Configuration** pane.
6. Click **OK** on the ArcGIS Maps web part properties pane to save your changes and exit edit mode.
7. Click **Save** to save your page.

Print a map

The **Print Map** tool prints exactly what is displayed in the map on your screen. Configure your map before clicking **Print Map**.

1. Set your map to display as you want it to look in your printout. This includes zooming to the appropriate level and panning the map to display the features you want to see in the printed map.
2. From the **Map Tools** toolbar (or the toolbar you specified for the **Print Map** tool), click **Print Map**. The **Print Map** pane opens, displaying the map at its current extent and zoom level.
3. Click **Print**.
A second browser window opens, showing a preview of your printed map. The standard Microsoft Windows **Print** dialog box also opens.
4. Choose the desired print options and click **Print**.



Note:

- When printing custom symbol sets, custom symbols must specify symbols that are publicly and anonymously accessible. If the symbol images are hosted under a custom site, the site must be anonymously authenticated. No extra authentication is supported. For example, if you use a symbol URL that requires a user name and password, printing layers containing these symbols will fail.

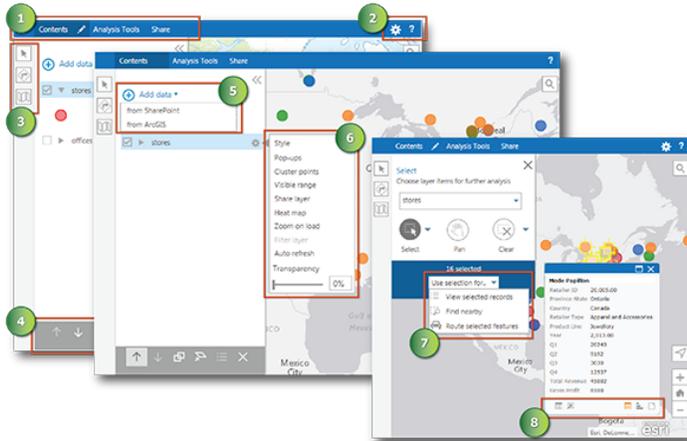
Change the default tools and behaviors

ArcGIS Maps for SharePoint includes a standard set of tools and functionality, such as panning, zooming, selecting features, and routing. While the default tools cover a large range of functionality, you may want to add or remove tools to fulfill your users' needs.

You must be an administrator on the SharePoint site to access the ArcGIS Maps for SharePoint configuration options.

Tool containers

Tools are displayed in the ArcGIS Maps's tool containers. Customizable tool containers are as follows:

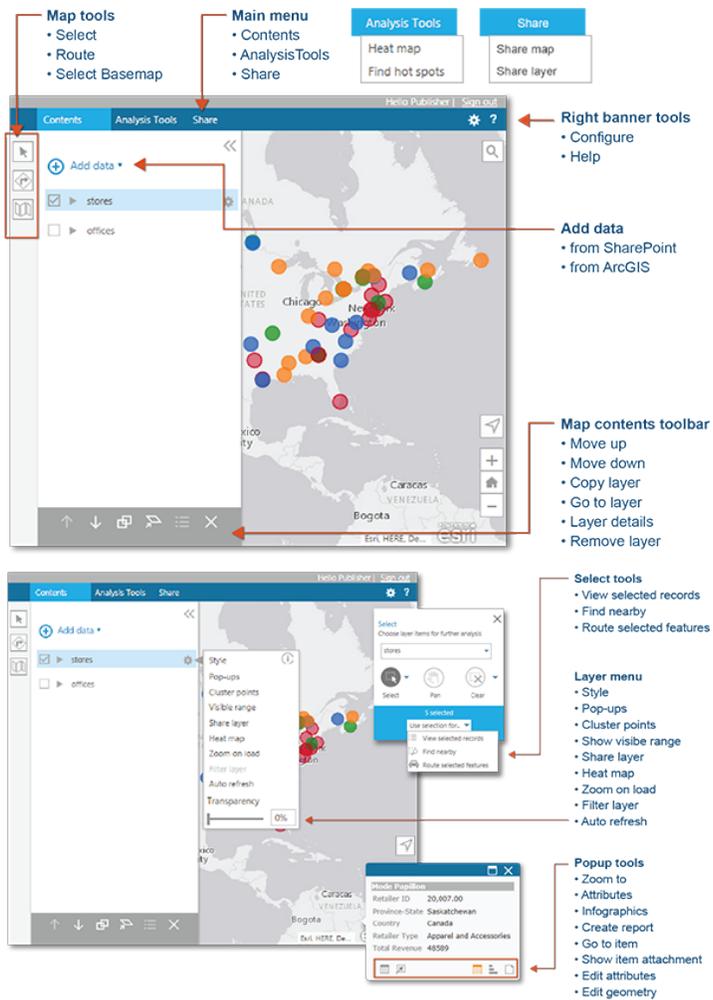


1. Main application menu
2. Right banner tools
3. Map tools toolbar
4. Map contents toolbar
5. Add data tools menu
6. Layer options pane
7. Selection tools menu
8. Toolbar on pop-ups

Built-in tools

ArcGIS Maps for SharePoint comes with a variety of built-in tools that provide the basic functionality for the application. These include menus, buttons on toolbars, and tools selected through a menu.

You can add or remove these tools using the ArcGIS Maps **Configuration** pane. The following images show the out-of-the-box tools included with ArcGIS Maps for SharePoint and their location in the user interface.

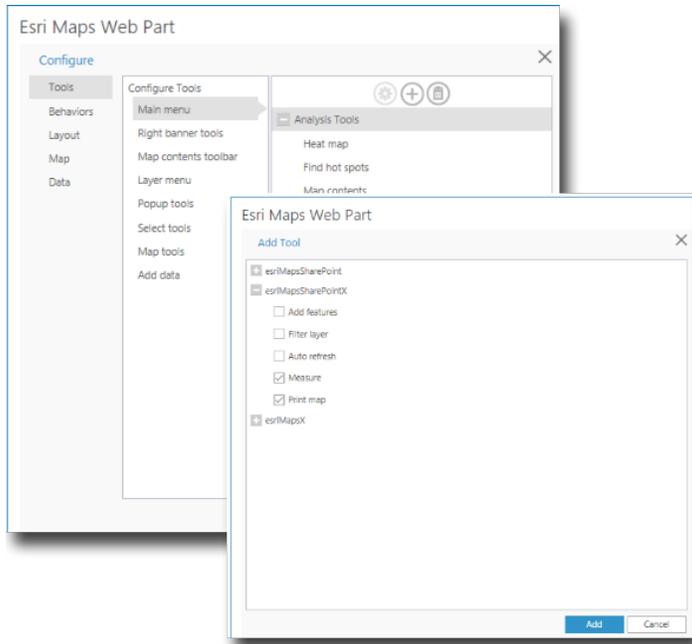


Add a tool

Prerequisite:

You must be an administrator on the SharePoint site to access the ArcGIS Maps for SharePoint Administration menu.

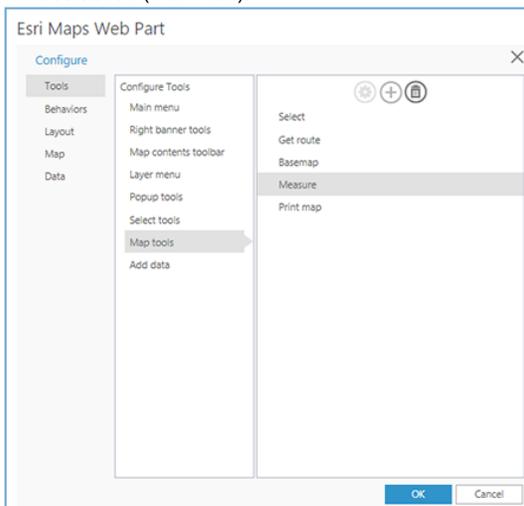
1. Edit your page and place the ArcGIS Maps in [Edit mode](#).
2.  Click **Configure** to open the **Configuration** pane.
3. Under **Configure**, click **Tools**.
4. Click the tool container to which you want to add the tool.
 -  **Note:** When adding tools to the **Main** menu, tools must be placed under **Analysis Tools** or **Share**. Tools added to the root level will not appear in the Web Part.
5. Click **Add** (plus sign), expand the categories, and check the check box beside each desired tool.



6. Click **Add** and click **OK** to close the **Configuration** pane.
7. Click **Apply** or **OK** on the ArcGIS Maps properties pane to save changes to the map.
8. Click **Save** to save your page.

Remove a tool

1. Edit your page and place the ArcGIS Maps in [Edit mode](#).
2.  Click **Configure** to open the **Configuration** pane.
3. Under **Configure**, click **Tools**.
4. Click the tool container that contains the tools you want to remove.
5. Highlight the tool you want to remove.
6. Click **Remove** (trash can).



7. Click **OK** to close the **Configuration** pane.
8. Click **Apply** or **OK** on the ArcGIS Maps properties pane to save changes to the map.

9. Click **Save** to save your page.

Built-in behaviors

Behaviors execute functionality, but not in response to a particular user interaction (a mouse click, for example). Rather, behaviors are executed in response to some other mechanism; for example, behaviors can be created to respond to events fired by the map, a layer, other tools in the application, or even the hosting system itself.

One such behavior that can be configured for the ArcGIS Maps is **Web Part Connectivity**. To configure this behavior, refer to [Web part communication](#).

Custom tools

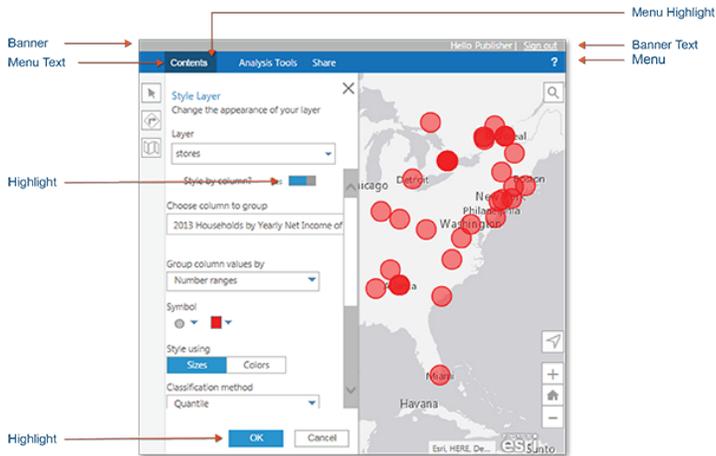
ArcGIS Maps for SharePoint allows you to create your own custom tools and behaviors. For more information on creating custom tools, see the documentation section on [extensibility](#).

Change the layout colors

You can customize the look of the ArcGIS Maps Web Part by changing the user interface (UI) layout colors and fonts.

You can customize the following areas of the layout:

- Banner
- Banner text
- Menu
- Menu text
- Menu highlight
- Highlight



To change the Web Part layout, do the following:

1. Edit your page and place the ArcGIS Maps Web Part into [Edit mode](#).
2. Click **Configure**  to open the **Configuration** pane.
3. Under **Configure**, click **Layout**.
4. To change the colors, use the color pickers or type the numeric RGB or HSV values.
5. To change the font, choose a font set from the **Default text** drop-down menu.
6. Click **OK**.
7. Click **Apply** or **OK** on the ArcGIS Maps Web Part properties pane to save your changes.

Change the map selection colors

You can customize the ArcGIS Maps Web Part by changing the color of the selection tool. The color is applied when you select items on the map using the selection tool.

To change the Web Part selection color, do the following:

1. Edit your page and place the ArcGIS Maps Web Part into [Edit mode](#).
2. Click **Configure**  to open the **Configuration** pane.
3. Under **Configure**, click **Map**.
4. To change the selection color, use the color pickers or type the numeric RGB or HSV values.
5. Click **OK**.
6. Click **Apply** or **OK** on the ArcGIS Maps Web Part properties pane to save your changes.

Change the map data formats

You can customize the ArcGIS Maps Web Part by changing the data formats displayed in the layout. The data format changes apply to percentage, currency, number, and date formats.

To change the Web Part layout, do the following:

1. Edit your page and place the ArcGIS Maps Web Part into [Edit mode](#).
2. Click **Configure**  to open the **Configuration** pane.
3. Under **Configure**, click **Data**.
4. Use the drop-down menus to choose data formats.
5. Click **OK**.
6. Click **Apply** or **OK** on the ArcGIS Maps Web Part properties pane to save your changes.

Overview

ArcGIS Maps for SharePoint allows you to add functionality to your application by adding tools, behaviors, and custom picture marker sets using extension packs.

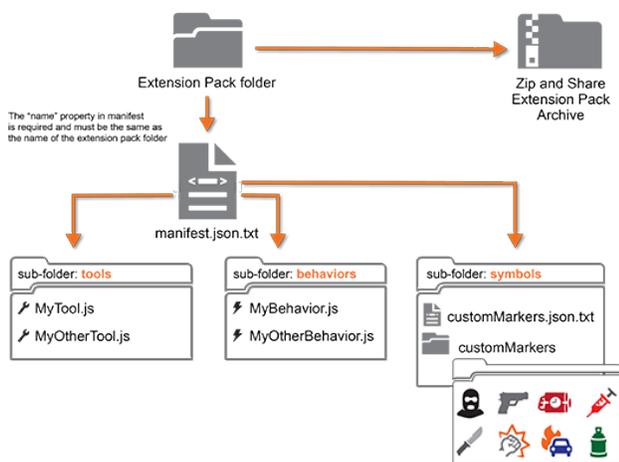
Extension packs

Central to extensibility in ArcGIS Maps for SharePoint is the **extension pack**. An extension pack is a container for all tools, behaviors, and custom picture marker sets that can be loaded into the application.

An extension pack typically consists of a uniquely named folder that contains the required manifest file; the JavaScript files that describe the tool, behavior, or picture marker sets; and any required supporting files. Extension packs can contain more than one tool, behavior, or picture marker set.

The manifest is provided to ArcGIS Maps for SharePoint in the form of a JSON file and must be named `manifest.json.txt`.

Although it is not required, it is generally a best practice to package tools, behaviors, and picture marker sets in separate, dedicated folders, as shown below.



ArcGIS Maps for SharePoint can have multiple extension packs. The functionality available in ArcGIS Maps for SharePoint on application startup is defined in the `tool_collections.json.txt` and `behaviors.json.txt` files in the ArcGIS Maps for SharePoint Administration **Configuration Files** list. Site collection administrators can edit these files to modify the default tools and behaviors.

Extension pack names

Dojo keeps an internal list of namespaces and package names, and does not allow different packages to have the same name. If your extension pack contains a module that you reference using its absolute path (for example, `acme/stuff/SomeModule`), you must name the extension pack in the same manner as you would name the package in a regular Dojo application (for example, `acme`).

For example, the following references a module in a package named `acme`; in this case, the extension pack must be named `acme`:

```
define([
  "dojo/_base/declare",
  "esriMaps/extensions/tools/_Tool",
  "acme/stuff/SomeModule"],
  function(declare, _Tool, SomeModule) {
    return declare(_Tool, {
      constructor: function() {
        var myModule = new SomeModule();
      }
    });
  });
```

If your code does not reference a module in the package using its absolute path, as shown in the code sample below, you can name your extension pack using any name that does not include special characters or spaces. You must ensure, however, that your tool or template code does not reference a specific module.

```
define([
  "dojo/_base/declare",
  "esriMaps/extensions/tools/_Tool",
  "./stuff/SomeModule"],
  function(declare, _Tool, SomeModule) {
    return declare(_Tool, {
      constructor: function() {
        var myModule = new SomeModule();
      }
    });
  });
```

Manifest file

The manifest included in an extension pack contains descriptions of the extensions contained within that extension pack; these include tools, behaviors, and picture marker sets. These descriptions, written in JSON format, outline the properties of each extension; for example, a tool's description must include name, location, and label properties, but may also optionally include other initial properties. The path defined in the location property is relative to the location of the manifest file.

The basic structure of an extension pack manifest, in JSON format, is as follows:

 **Caution:** Do not include comments in your JSON file.

```
{
  "name": "myExtensions",
  "description": "",
  "tools": [],
  "behaviors": [],
  "pictureMarkerSets": []
}
```

Where:

- **name**—Required. Name of the extension pack. Must be the same as the name of the extension pack folder, for example, **myExtensions**. See [Extension pack names](#).
- **description**—Optional. Brief description of the extension pack.
- **tools**—Array of JSON objects, each describing an individual tool. See [Tool description](#).
- **behaviors**—Array of JSON objects, each describing an individual behavior. See [Behavior description](#).
- **pictureMarkerSets**—Array of JSON objects, each describing a custom picture marker set. See [Picture Marker Set description](#).

Tool description

```
{
  "name": "myTool",
  "location": "./tools/MyTool.js",
  "label": "My Tool",
  "description": "This does something",
  "iconClass": "logToolIcon",
  "showTooltip": true,
  "tooltip": "tooltip message"
}
```

Where:

- **name**—Tool name; must be unique within the manifest.
- **location**—Path to the tool's JS file, relative to `manifest.json.txt`.
- **label**—Label displayed in the application's user interface.
- **description**—Optional. Brief description of the tool.
- **iconClass**—Optional. Name of the CSS class used to style the tool's icon.
- **showTooltip**—Optional. If true, displays the tooltip defined in the tooltip property.
- **tooltip**—Optional. Defines the content of the tooltip.

The `name`, `location`, and `label` properties are required; other properties are optional.

Behavior description

```
{
  "name": "myBehavior",
  "location": "./behaviors/MyBehavior.js",
  "label": "My Behavior"
}
```

Where:

- name—Behavior name; must be unique within the manifest.
- location—Path to the behavior's JS file, relative to `manifest.json.txt`.
- label—Label displayed in the application's user interface.

Picture marker set description

```
{
  "label" : "My Picture Marker Set",
  "description" : "This is my Picture Marker Set",
  "location" : "./symbols/MyPictureMarkerSet.json.txt"
}
```

Where:

- label—Label displayed in the application's user interface.
- description—Optional. Brief description of the picture marker set.
- location—Path of the picture marker set's JSON.txt file, relative to `manifest.json.txt`.

Example

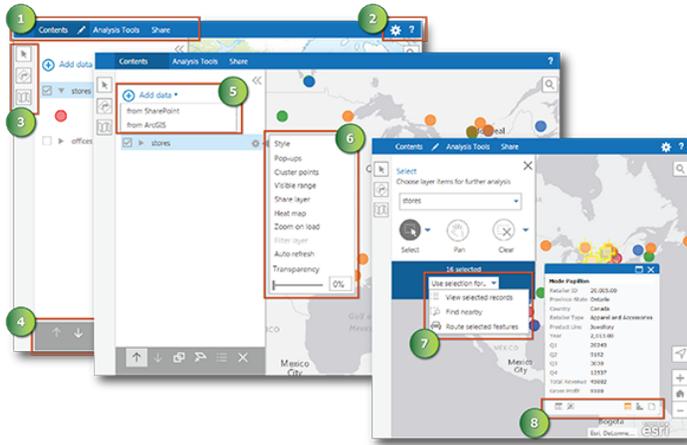
The following code shows an example of a populated `manifest.json.txt` file. It contains the definition for two tools, one behavior, and one picture marker set.

```
{
  "name" : "myExtensions",
  "description" : "",
  "tools" : [
    {
      "name" : "MyTool",
      "location" : "./tools/MyTool.js",
      "label": "My Tool"
    },
    {
      "name" : "MyOtherTool",
      "location" : "./tools/MyOtherTool.js",
      "label" : "My Other Tool"
    }
  ],
  "behaviors" : [
    {
      "name" : "MyBehavior",
      "location" : "./behaviors/MyBehavior.js",
      "label" : "My Behavior"
    }
  ],
  "pictureMarkerSets": [
    {
      "label": "My Picture Marker Set",
      "description" : "My Picture Marker Set",
      "location": "./symbols/MyPictureMarkerSet.json.txt"
    }
  ]
}
```

Tool collections

Tool collections are named sets of tools; they determine which tools are displayed and made available to the user. The ArcGIS Maps for SharePoint layout is composed of tool containers, a series of widgets that can be configured to display different sets of tools and behaviors. Each tool container is responsible for displaying a specific set of named tool collections.

The following images show the default tool collections:



1. **main**—Menu items that appear on the main menu, for example, Analysis Tools and Share.
2. **rightBanner**—Tools on the application's main right banner tools toolbar, for example, Configure and Help.
3. **mapTools**—Tools on the Map tools toolbar, for example, Select, Route, and Basemap.
4. **layerPrimary**—Tools on the application's Map contents toolbar, for example, Move up, Move down, Duplicate layer, Zoom to, Layer details, and Remove layer.
5. **addData**—Tools on the Add data drop-down menu, for example, from SharePoint and from ArcGIS.
6. **layerSecondary**—Tools or widgets related to a selected layer, for example, Style, Pop-ups, Cluster points, and Filter layer.
7. **select**—Tools available from the Select Tools drop-down menu, for example, View selected records, Find nearby, and Route selected features.
8. **popup**—Tools on the pop-up toolbar, for example, Zoom to, Open Item, and Infographics.

The tool collection has a configuration file in JSON format, named `tool_collections.json.txt`. The file lists the IDs of tool collections, relative to the layout's tool containers. Each tool collection can contain individual tools, or tools assembled into tool groups. For each tool, the file lists the unique ID and name of the tool, along with the path of the extension pack that contains it.

For example:

⚠ Caution: Comments are included here for documentation purposes only. Do not include comments in your JSON files.

```

[[
  {
    "id": "main",
    "tools": [
      {
        "label": "First Menu",
        "tools": [
          {
            "name": "Menu1",
            "extensionPacName": "myExtensions"
          },
          {
            "name": "Menu2",
            "extensionPacName": "myExtensions"
          }
        ]
      },
      {
        "label": "Second Menu",
        "tools": [
          {
            "name": "Tool1",
            "extensionPacName": "myExtensions"
          },
          {
            "name": "Tool2",
            "extensionPacName": "myExtensions"
          },
          {
            "name": "Tool3",
            "extensionPacName": "myExtensions"
          },
          {
            "name": "Tool4",
            "extensionPacName": "myExtensions"
          }
        ]
      }
    ]
  }
]]

```

 **Note:** When you define a tool, the tool's name attribute must match the tool name specified in the tool's extension pack manifest (`manifest.json.txt`). To see the default Tool Collection definition, see `tool_collection.json.txt` listed under **Configuration Files** in the ArcGIS Maps for SharePoint **Site settings**. This file determines the tools that are loaded when creating a new ArcGIS Maps Web Part. You can modify the tool definitions to overwrite properties defined in the extension pack's manifest or other properties. For example, to change a tool's label at run time, edit the value in the tool collection.

For example:

```
. . .
"name" : "MyTool",
"extensionPackName" : "MyExtensions",
"label" : "Display a different label",
"newProperty" : "new value"
```

Behavior definition

You can define one or more behaviors in ArcGIS Maps for SharePoint. Behaviors are defined in a configuration file in JSON format, named `behaviors.json.txt`. This file is in the **Configuration Files** list of the ArcGIS Maps for SharePoint **Site settings**. You can modify the behavior definitions to overwrite properties defined in the extension pack's manifest or other properties.

For example:

```
[{
  "name": "MyCustomBehavior",
  "extensionPackName": "MyExtensions"
}]
```

Requirements

Web server

Developing with the ArcGIS Maps extensibility framework requires a web server.

For additional information on options for configuring a development environment, see [Set up a development environment](#).

Supported browsers

The ArcGIS Maps extensibility framework is built on the ArcGIS API for JavaScript and supports the same browsers. See [Supported browsers](#) for details.

JavaScript and Dojo

The ArcGIS Maps extensibility framework is built on the ArcGIS API for JavaScript, so a familiarity with both the JavaScript programming language and Esri JavaScript API is essential. See [ArcGIS API for JavaScript Overview](#) to get started. Additionally, Esri uses Dojo, an open-source toolkit, to simplify the development process and to ensure that its applications behave the same in different browsers. For more information, see [Working with dojo](#) or the [Dojo Toolkit Reference Guide](#). The ArcGIS Maps extensibility framework supports only Asynchronous Module Definition (AMD) style code.

Naming conventions

The ArcGIS Maps extensibility framework APIs follow the Dojo coding style outline on the [Dojo Toolkit](#) website.

Additionally, the ArcGIS Maps extensibility framework uses the following conventions:

- **_ClassName**—An abstract base class; for example **_Adapter**. These names are nouns written in UpperCamelCase, preceded by an underscore character. Abstract base classes should never be instantiated.
- **_NameMixin**—A mixin class; for example, **_SelectedLayerMixin**. These names are nouns written in UpperCamelCase, preceded by an underscore character and always include the term Mixin.
- **__VirtualClassName**—Denotes a class that exists for documentation purposes only; it cannot be instantiated.

A virtual class describes either:

- the type of object that should be passed as a parameter to a method; for example, a keyword argument
- the return value of a method

These names are written in UpperCamelCase and are preceded by a double underscore.

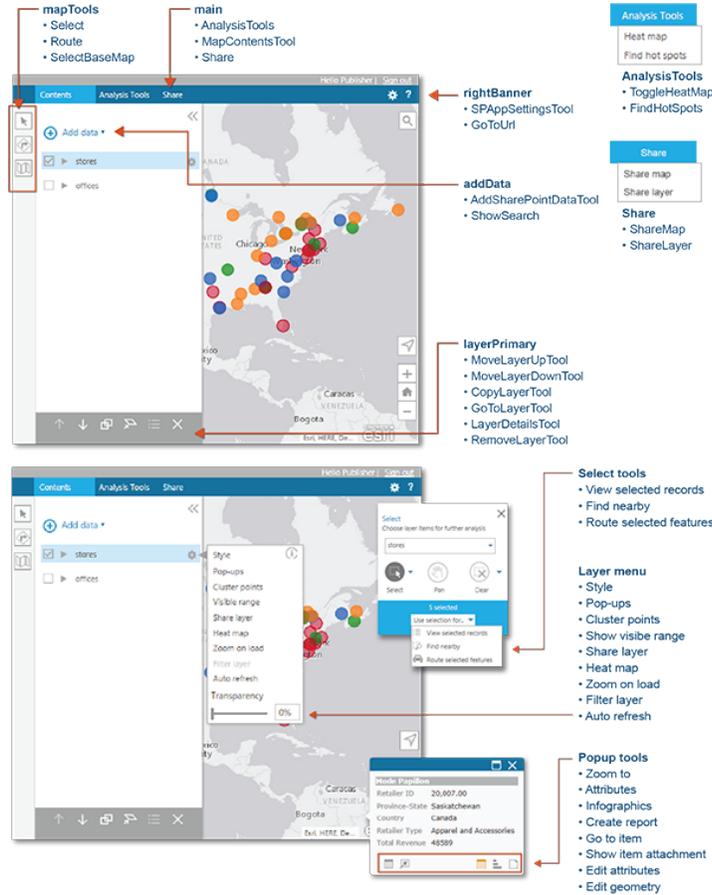
Create a tool

As a developer, you may want to add functionality to ArcGIS Maps for SharePoint by creating custom tools. Tools are executed through user interaction. They can be added as buttons, tools, or menu items to tool containers in the map.

Built-in tools

ArcGIS Maps for SharePoint comes with a variety of built-in tools that provide the basic functionality for the application. These include menus, buttons on toolbars, and tools selected through a menu.

The following image shows the built-in tools included with ArcGIS Maps for SharePoint. These are defined in `tool_collection.json.txt`, listed under **Configuration Files** in the ArcGIS Maps for SharePoint **Site settings**.



Create a new tool

The following example illustrates the implementation of a tool that displays an alert message when clicked. For more information, see the [Tool class](#) documentation in the API reference section.

```
define([
    "dojo/_base/declare",
    "esriMaps/extensions/tools/_Tool"
], function(declare, _Tool) {

    return declare(_Tool, {
        message: "Welcome!",
        label: "My Tool",
        description: "This is my custom tool",
        execute: function() { // Function called when tool is clicked in the app
            alert(this.message);
        },
        ...
    });
});
```

Tools that show widgets

Some tools need to show widgets as part of their functionality. When implementing a tool that shows a widget, it is recommended that you implement the following logic to check for the existence of the widget.

Additionally, when uploading extensions with widgets with templates (.html files) from a URL, there is the potential for a cross-domain error if the extension pack location is on a different domain than the SharePoint server. To resolve this, there are two options:

- Embed the HTML content into the widget's JavaScript file. This makes for a longer file but resolves the issue.
- Use the [Dojo build process](#) to bundle multiple resources into a single resource.

Here are the solutions:

- The tool.execute method is called for the first time.
- The tool creates an instance of the widget and stores a reference to it on the tool.

For example:

```
this._myWidget = new MyWidget({
  layer:this.selectedLayer
});
```

- The tool shows the widget by calling the following:

```
layout.showWidget(this._myWidget)
```

- The tool creates a listener for an event to destroy the widget and delete the reference to the widget.

For example:

```
widget.on('ok', function(){
  widget.destroy();
  tool._myWidget = null;
});
```

- Check to see if the reference to the widget still exists; if it does, it means the user didn't close the tool. If the reference still exists, set the properties on the existing widget (`this._myWidget.set('layer', this.selectedLayer)`) to update the state of the widget and call `layout.showWidget(this._myWidget)` again. The layout should bring the widget forward if it was hidden by another widget.

Set a tool's icon

Some tools display an icon, while others only display text. To set the icon for a tool, you must first create an icon, and then create a style sheet and assign the style rule to the tool.

- Create an icon that measures 24x24 pixels to best fit into the layout. Use an existing icon as a guideline for colors and positioning.
- Create a CSS style sheet with a class rule that contains the icon as a background image.

For example:

```
.myToolIcon {
  background-image:url(./umbrella.png);
}
```

- Assign the class rule to the `iconClass` property of the tool, either in the tool module or in the tool's manifest. To load the class rule, you must inject the CSS style sheet into the page. You can use the `xstyle` package for this purpose.

Your tool module would then resemble the following:

```
define([
  "dojo/_base/declare",
  "esriMaps/extensions/tools/_Tool",
  "xstyle!./stylesheet.css"
], function(declare, Tool) {
  return declare([_Tool], {
    message:"My Tool",
    isDisabled:false,

    execute:function() {
      console.log(this.message);
    }
  });
});
```

If you added the `iconClass` to the tool's manifest, the code would resemble the following:

```
{
  "tools": [{
    "name": "MyTool",
    "location": "./tools/MyTool.js",
    "label": "This is my tool",
    "iconClass": "myToolIcon"
  }]
}
```

Add a tool to ArcGIS Maps for SharePoint

Tools, behaviors, and picture marker sets are packaged in collections named extension packs, which consist of the code files for each extension, any supporting files, and a manifest file that describes the extensions contained within that extension pack. These descriptions, written in JSON format, outline the properties of each extension; for example, a tool's description must include name, location, and label properties, but it may also include other optional properties.

See [Add extensions](#) for more information.

Create a behavior

As a developer, you may want to add functionality to ArcGIS Maps for SharePoint by creating custom behaviors. Behaviors are extensions that execute functionality, but not in response to a particular user interaction (a mouse click, for example). Rather, behaviors are executed in response to some other mechanism; for example, behaviors can be created to respond to events fired by the map, a layer, other tools in the application, or even the hosting system itself.

All behaviors extend the `esriMaps/extensions/behaviors/_Behavior` base class. Behaviors triggered by events on a specific layer extend the `esriMaps/extensions/behaviors/_LayerBehavior` class; those triggered by events on the map itself extend the `esriMaps/extensions/behaviors/_MapBehavior` class. Behaviors triggered by an event on a specific target extend the `esriMaps/behaviors/_EventBehavior` class.

Create a new behavior

The following example shows the implementation of a behavior that uses a browser's `window.console` to log the extent of the current map whenever the extent changes. For more information, see the [Behavior class](#) documentation in the API reference section.

```
require([
  "dojo/_base/declare",
  "esriMaps/extensions/behavior/_MapBehavior"],
  function(declare, _MapBehavior) {
    return declare(_MapBehavior, {
      eventName: "extent-change",

      execute: function(delta, extent, levelChange, lod) {
        console.log("Extent changed", this.map, extent);
      }
    });
  });
```

Add a behavior to ArcGIS Maps for SharePoint

Tools, behaviors, and picture marker sets are packaged in collections named extension packs, which consist of the code files for each extension, any supporting files, and a manifest file that describes the extensions contained within that extension pack. These descriptions, written in JSON format, outline the properties of each extension; for example, a behavior's description must include name and location properties, but it may also include other optional properties.

See [Add extensions](#) for more information.

Create picture marker sets

As a developer, you may want to customize the symbols within ArcGIS Maps for SharePoint by creating custom picture marker sets. Picture marker sets are extensions that add custom symbols to symbolize your data. Custom symbols can consist of images such as PNGs and JPGs, or URLs to an image.

pictureMarkerSet.json.txt file

When you create a custom picture marker set, you place an array of picture marker set definitions in a JSON configuration file named <picturemarkerSetName>.json.txt, and place the file in the same folder as the custom symbols in the extension pack. This file determines the picture marker sets that are loaded symbolizing data.

Create a new picture marker set

The following example shows the implementation of a picture marker set that uses two images: one packaged with the extension pack and the second one as a URL pointing to an image.

```
[
  {
    "type": "esriPMS",
    "url": "extensionPacName/symbols/image1.png",
    "width": "20",
    "height": "20",
    "xoffset": "0",
    "yoffset": "10"
  },
  {
    "type": "esriPMS",
    "url": "http://mypicturemarkerset.com/somepicture",
    "width": "20",
    "height": "20",
    "xoffset": "0",
    "yoffset": "10"
  }
]
```

Note: Some restrictions apply when naming your extension pack. If your picture marker set references a module by its absolute path (for example, `acme/stuff/SomeModule`), you must name the extension pack in the same manner as you name the package in a regular Dojo application (for example, `acme`). For more information, see [Extension pack names](#).

Add a picture marker set to ArcGIS Maps for SharePoint

Tools, behaviors, and picture marker sets are packaged in collections named extension packs, which consists of the code files for each extension, any supporting files, and a manifest file that describes the extensions contained within that extension pack. These descriptions, written in JSON format, outline the properties of each extension; for example, a picture marker set's description must include label and location properties but may also include other optional properties.

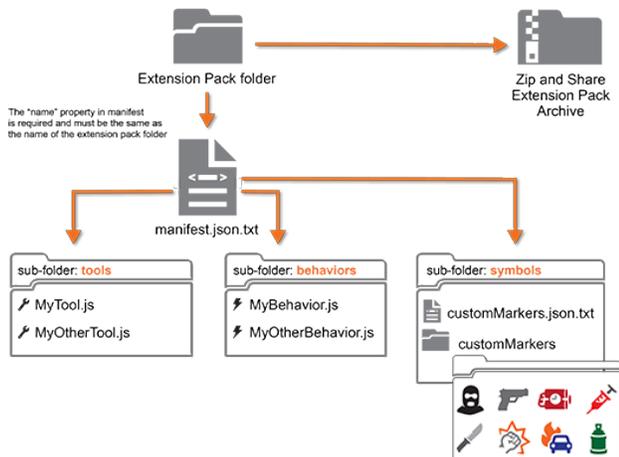
See [Add extensions](#) for more information.

Add extensions

ArcGIS Maps for SharePoint comes with a standard set of tools and functionality, such as panning, zooming, selecting features, and routing. While the default tools cover a large range of functionality, you may want to develop custom functionality to fulfill your users' needs. ArcGIS Maps for SharePoint provides an extensibility framework that allows you to develop tools and behaviors.

After you create your extensions, you add them to an extension pack. An extension pack consists of the tool or behavior code, custom picture marker sets, any supporting files, and a manifest file that lists the name and path to those modules, along with other optional properties. The extension pack format allows you to bundle multiple extension types into a single package that can easily be shared.

Although it is not required, it is generally a best practice to package tools, behaviors, and picture marker sets in separate, dedicated folders, as shown below.



Create an extension pack

Tools, behaviors, and custom picture marker sets must be packaged in collections named extension packs. These extension packs allow for easy deployment and sharing of tool or behavior collections.

To create an extension pack, do the following.

1. Create your custom tool, behavior, or picture marker set. See [Create a tool](#), [Create a behavior](#), or [Create a picture marker set](#).
2. Create a manifest file named `manifest.json.txt`.

The manifest included in an extension pack contains descriptions of the extensions within that extension pack; these include tools, behaviors, and picture marker sets. These descriptions, written in JSON format, outline the properties of each extension; for example, a tool's description must include `name` and `location` properties (and a `label` property for tools), but may also optionally include other initial properties. The path defined in the `location` property is relative to the location of the manifest file. The extension pack's `name` property is required.

The following code illustrates a manifest file that lists a custom tool, a custom behavior, and a custom picture marker set. The `name` properties for tools and behaviors must match the name attributes specified in the tool collections and behaviors configuration files, respectively. The tool includes the required `label` property, which will appear in the application's UI, and an optional `tooltip` property, which defines the message that appears when a user hovers over the tool.

```
{
  "name": "extensionPack",
  "description": "Basic tool, behavior, and picture marker set examples",
  "tools": [
    {
      "name": "myTool",
      "location": "./tools/myTool.js",
      "label": "My Tool",
      "tooltip": "An example of a custom tool"
    }
  ],
  "behaviors": [
    {
      "name": "myBehavior",
      "location": "./behaviors/myBehavior.js"
    }
  ],
  "pictureMarkerSets": [
    {
      "label": "Display Label",
      "description": "My custom markers",
      "location": "./symbols/myPictureMarkers.json.txt"
    }
  ]
}
```

3. Place the manifest file in a folder named according to the `name` property in the manifest.

 **Note:** Some restrictions apply when naming your extension pack. If your tool or behavior references a module by its absolute path (for example, `acme/stuff/SomeModule`), you must name the extension pack in the same manner as you name the package in a regular Dojo application (for example, `acme`). For more information, see [Extension pack names](#).

4. In the extension pack folder, create separate subfolders for tools, behaviors, and symbols, and place all related behavior, tool, and picture marker files in the appropriate folders.
Although this is not required, it is considered a best practice.
 - For tools and behaviors, the subfolders (tools | behaviors) should include the tool or behavior's JavaScript file and any related resources files. (See [Create a tool](#) or [Create a behavior](#).)
 - For picture marker sets, the subfolder (symbols) should include the picture marker set definition file and all related resource files, such as images. (See [Create picture marker sets](#).)
5. Zip the extension pack folder and place the zipped package in a location that can be accessed by ArcGIS Maps for SharePoint.
6. The extensions folder and its contents constitute your extension pack.

Add to SharePoint on-premises

To add an extension pack to SharePoint 2010, 2013, or 2016, do the following:

- Add the extension pack to the Extensions list.
- Add the extension pack to the ArcGIS Maps web part.

Add to Extensions list

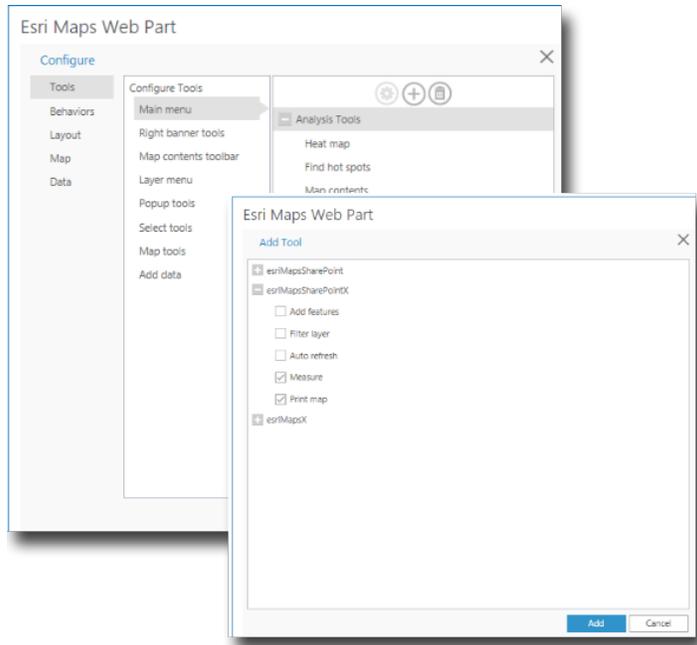
Prerequisite:

You must be an administrator on the SharePoint site to access the ArcGIS Maps for SharePoint Administration menu.

1. Browse to the site's **Site Settings**.
2. Under **ArcGIS Maps for SharePoint Administration**, click **Manage Extensions**.
3. Click the **Add extension packs** drop-down arrow and choose one of the following:
 - Upload—Add an extension pack from your computer or other location. The extension pack must be compressed with a .zip file extension.
 - Link from SharePoint—Add an extension pack that already exists in the SharePoint site. The extension pack must reside in a document library on an accessible SharePoint site. The extension pack must not be compressed into a ZIP file; the entire extension pack including all folders and files must be uploaded to the document library. The `manifest.json.txt` file must be accessible at the root.
 - Link from Address—Add an extension pack from any website as long as it allows anonymous access for downloading. The extension pack must not be compressed into a ZIP file; the entire extension pack including all folders and files must be uploaded. The `manifest.json.txt` file must be accessible at the root.

Add to ArcGIS Maps web part

1. Edit the page and place the ArcGIS Maps web part in [edit mode](#).
2. Click **Configure**  to open the **Configuration** pane.
3. Under **Configure**, click **Tools** or **Behaviors**, depending on which type of extension you want to add.
When adding tools to the Main menu, tools must be placed under **Analysis Tools** or **Share**. Tools added to the root level will not appear in the web part.
4. Click **Add** (+), expand the desired extension pack, and check the check box beside the extension you want to add.



5. Click **Add** and click **OK**.
6. Click **Apply** or **OK** on the ArcGIS Maps web part properties to save changes.
7. Click **Save** to save the page.

Share an extension pack

You can share extension packs by packaging the extensions folder into an archive (ZIP file) and distributing the archive to your colleagues. Ensure that the folder contains all the custom tool and behavior JavaScript files, picture marker definitions, and the manifest.json.txt file, along with any other supporting files.

Samples

The samples listed below demonstrate basic extensibility functionality available with ArcGIS Maps for SharePoint. Each sample is already in the required extension pack format; download the ZIP file and add it according to the instructions in [Add extensions](#).

See the [code usage restrictions](#) for additional information.

Sample apps

Basic Extension Pack (ZIP file)	This sample demonstrates how to configure an extension pack with a custom tool and a behavior. <ul style="list-style-type: none"> • A custom tool that displays a message in the alert dialog box when the tool is clicked • A custom behavior that displays a message in the alert dialog box on a map click event
Measure widget (ZIP file)	This sample demonstrates how to configure widgets from the ArcGIS API for JavaScript. The measurement widget is displayed in the Map Contents pane. ArcGIS Maps for SharePoint already contains a Measure tool by default; this sample simply demonstrates how to include a premade widget in the app.
Constrain extent (ZIP file)	This sample demonstrates a behavior that constrains the map extent to a certain geographic location.
Redfin Search (ZIP file)	This sample demonstrates how to integrate the Redfin real estate listing search tool into the map's pop-up toolbar. This tool works with point layers in the map.
SharePoint communication via the JavaScript Client Object Model (ZIP file)	This sample contains a Hello World sample to demonstrate communication with SharePoint via the JavaScript Client Object Model. See the JavaScript API reference for SharePoint 2013 or the JavaScript Class Library (SharePoint 2010) for more information. This sample applies only to SharePoint on-premises.

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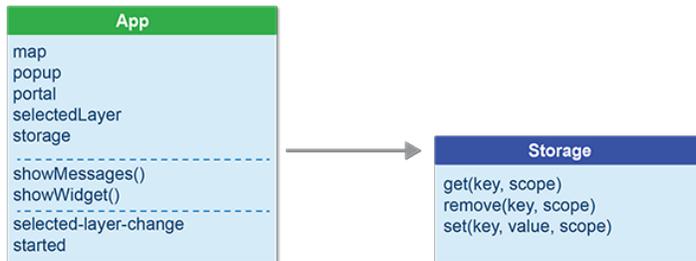
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For additional information, contact: Environmental Systems Research Institute, Inc. Attn: Contracts and Legal Services Department 380 New York Street Redlands, California, 92373 USA

email: contracts@esri.com

App

App is the main class that instantiates the application. It defines the mapping application and exposes map functionality. Storage provides an interface for storing and retrieving information for the application.



App

Properties

Name	Type	Summary
map	esri/Map	Returns the instance of the Map in the App.
popup	esri/dijit/Popup	The Popup.
portal	esri/arcgis/Portal	An instance of a ArcGIS Enterprise object.
selectedLayer	esri/layers/Layer	The currently selected layer in the Contents pane.
storage	Object	Provides functions to store and retrieve information.

Methods

Name	Return Type	Summary
showMessage(title, message, confirm)	Nothing	Used to display a message.
Method details:		
· title		Title text displayed at the top of the message.
· message		Message text to display under the title.
· confirm		Boolean value indicating if the message has an OK button when confirm = false or Yes and No buttons when confirm = true.
showWidget(widget, options)	Dialog	Used to show a widget.
Method details:		
· widget		The dojo widget to display.
· options		Options to display. JSON format indicating the title of the widget container, subtitle of the widget container, and whether the widget is modal or non-modal. By default, the widget will be nonmodal (showModal = false).

Events

On Event	Event Properties	Description
selected-layer-change	esri/layers/Layer	Fires when the selected layer changes.
started		Fires when the app loading sequence has completed and the App has started.

Storage

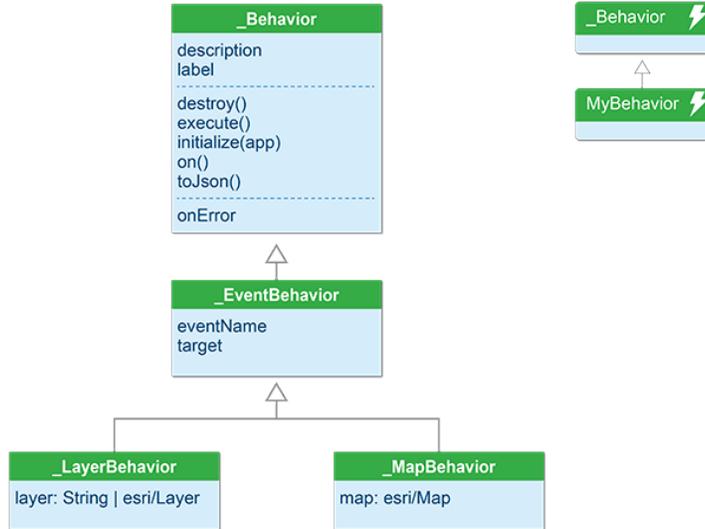
Methods

Name	Return Type	Summary
get(key, scope)	Any	Returns the value associated with the specified key. If scope is specified, then the key-value map will only be retrieved from the respective storage; otherwise, this function will check all storage methods.
Method details:		
· key		The key to use to retrieve the value.
· scope		The scope of the value to retrieve.

remove(key, scope)	Nothing	Removes the key-value pairs associated with the specific key from storage.
Method details:		
· key		The key to be removed from storage.
· scope		The scope of the value to be removed.
set(key, value, scope)	Nothing	Stores a key-value map. If scope is specified, then the key-value map will be stored with the respective storage method.
Method details:		
· key		A key with which to store the value.
· value		The value to store.
· scope		The scope of the value to be set.

Behavior

As a developer, you may want to add functionality to ArcGIS Maps for SharePoint by creating custom behaviors. Behaviors are extensions that execute functionality, but not in response to a particular user interaction (a mouse click, for example). Rather, behaviors are executed in response to some other mechanism; for example, behaviors can be created to respond to events fired by the map, a layer, other tools in the application, or even the hosting system itself.



_Behavior

The base class for all behaviors.

```

define([
    "dojo/_base/declare",
    "dojo/_base/lang",
    "esriMaps/extensions/behaviors/_Behavior"
], function(declare, lang, Behavior) {

    // Create a custom behavior by inheriting _Behavior class
    return declare([Behavior], {
        label: "Time Refresh Behavior",
        description: "Time Refresh Behavior",
        initialize: function(app) {
            // Set a timer to call execute every 10 seconds.
            window.setInterval(lang.hitch(this, this.execute), 10000);
        },
        execute: function() {
            // When execute is called, log the current Date and Time to console.
            console.log (new Date());
        }
    });
});
    
```

_Behavior implements the following three dojo mixins:

- dojo/Stateful
- dojo/Evented
- dojo/Deferred

Properties

Name	Type	Summary
description	String	Description of the behavior.
label	String	Label for the behavior.

Methods

Name	Return type	Summary
destroy()	Nothing	Destroys the instance of the extension.
execute()	Nothing	Called in response to an event or an action. This function is called in response to an event. Use this function to write any actions that should be performed in response to the occurring event.
initialize(app)	Nothing	Initializes the extension.

toJson	Object	Returns the properties of the Behavior as a JSON string. If there are properties or settings that need to be saved, return them as a JSON. When the App is saved, the App calls each of the object's toJson method to get the properties that need to be saved.
--------	--------	---

Events

On Event	Event Properties	Description
onError		Use to report and log errors encountered in an extension.

_EventBehavior

The following code sample illustrates the implementation of a behavior that shows the mouse pointer when a user clicks on the app window.

```
require([
  "dojo/_base/declare",
  "esriMaps/extensions/behaviors/_EventBehavior"
], function(_EventBehavior) {
  return declare(_EventBehavior, {
    target: window,
    eventName: 'click',

    execute: function(e) {
      console.log({
        x: e.clientX,
        y: e.clientY
      });
    }
  });
});
```

Properties

Name	Type	Summary
eventName	String	Defines the event that triggers the execution of the behavior.
target	Object	Specifies the object on which to listen for events.

_LayerBehavior

A LayerBehavior executes a function when an event on a specified layer is fired.

The following code illustrates a sample LayerBehavior that logs a message when the opacity of a specific layer changes.

```
require([
  "dojo/_base/declare",
  "esriMaps/extensions/behaviors/_LayerBehavior"
], function(declare, _LayerBehavior) {
  return declare(_LayerBehavior, {
    layer: "myLayer",
    eventName: "opacity-change",

    execute: function(opacity) {
      console.log("Layer opacity changed", this.layer, opacity);
    }
  });
});
```

Properties

Name	Type	Summary
eventName	String	Defines the event to listen for on the layer and which triggers the execution of the behavior.
layer	String esri/Layer	The Layer in the Map, which is the source of the specified event. The layer may be specified as an ID or as an instance of a layer. If an ID is specified, this property will be replaced by an instance when the behavior is initialized. For more information, refer to the ArcGIS API for JavaScript help for Layer .

_MapBehavior

A MapBehavior executes a function when an event on the Map is fired.

The following code illustrates a sample MapBehavior that logs a message when the extent of the map changes.

```
require([
  "dojo/_base/declare",
  "esriMaps/extensions/behavior/_MapBehavior"
], function(declare, _MapBehavior) {
  return declare(_MapBehavior, {
    eventName: "extent-change",

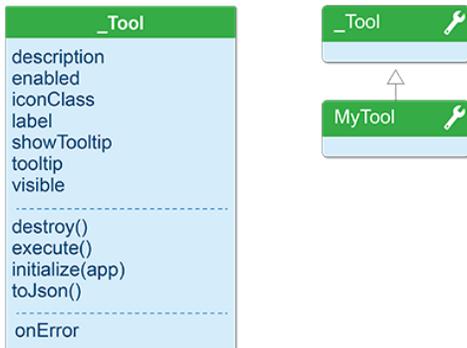
    execute: function(delta, extent, levelChange, lod) {
      console.log("Extent changed", this.map, extent);
    }
  });
});
```

Properties

Name	Type	Summary
eventName	String	Defines the event to listen for on the map and triggers the execution of the behavior.
map	String esri/Map	The Map object that is the source of the specified event. For more information, refer to the ArcGIS API for JavaScript API help for Map .

Tool

As a developer, you may want to add functionality to ArcGIS Maps for SharePoint by creating custom tools. Tools are executed through user interaction. They can be added as buttons, tools, or menu items to tool containers in the map.



`_Tool`

This is the base class for all tools. Extend this class to create a custom tool.

Description

Tools are extensions that are executed through user interaction; they provide a way to expose logic in the map that should be initiated by the user, as opposed to behaviors, which react to events. Tools can be added as buttons or tools on toolbars and menus in the ArcGIS Maps app. The following code sample illustrates a custom tool that records the extents of the map.

```
define([
  "dojo/_base/declare",
  "esriMaps/extensions/tools/_Tool",
], function(declare, _Tool) {
  return declare(_Tool, {
    label: "My Custom Tool",
    description: "A Tool that logs the Map extent",
    execute: function() {
      window.console.log (this.app.mapManager.map.extent);
    },
    ...
  });
});
```

`_Tool` implements the following three dojo mixins:

- `dojo/Stateful`
- `dojo/Evented`
- `dojo/Deferred`

Properties

Name	Type	Summary
<code>description</code>	String	Description of the tool.
<code>enabled</code>	Boolean	Indicates whether the tool is enabled. Use this property to define the availability of the tool. If the tool relies on the presence of a particular layer or particular state of the map, then use this property to disable the tool until the conditions are met. The default value is <code>true</code> .
<code>iconClass</code>	String	CSS class name. Specifies the CSS class name to use when the tool is placed in a tool container that shows icons.
<code>label</code>	String	Label for the tool.
<code>showTooltip</code>	Boolean	Defines the visibility of the <code>ToolTip</code> . Specifies whether the tool should display the <code>ToolTip</code> . The default value is <code>true</code> .
<code>tooltip</code>	String	The message displayed in the <code>ToolTip</code> . Specifies the message displayed as a <code>ToolTip</code> when the user hovers over the tool. If no <code>ToolTip</code> is set, accessing the <code>ToolTip</code> via <code>tool.get('tooltip')</code> defaults to the tool's description, or to the label if no description is set.
<code>visible</code>	Boolean	Defines the tool's visibility. Specifies whether a tool is visible. The default value is <code>true</code> .

Methods

Name	Return type	Summary
destroy()	Nothing	Destroys the instance of the extension.
execute()	Nothing	Called when the tool is clicked. If the intended result of clicking the tool is to display a widget or a custom UI, call the code to show the widget in this function to implement the desired functionality.
initialize(app)	Nothing	Initializes the extension.
toJson	Object	Returns the properties of the tool as a JSON string. If there are properties or settings that need to be saved, return them as a JSON. When the app is saved, the app calls each of the object's toJson method to get the properties that need to be saved.

Events

On Event	Event Properties	Description
onError		Use to report and log errors encountered in an extension.

Essential vocabulary

ArcGIS

ArcGIS provides an online infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the web. By signing in to your ArcGIS organization, you can access ready-to-use maps and apps, or create new maps that help you tell a story. With ArcGIS Maps for SharePoint, you can combine your business data with data from ArcGIS to create rich maps that help you analyze your data visually and make better decisions. ArcGIS also makes it easy to share your maps and map layers within your organization or with colleagues in the field.

For more information, see [ArcGIS Maps for SharePoint and ArcGIS](#).

Basemap

A basemap provides a geographical context, or background, for the content you want to display in a map. With ArcGIS Maps for SharePoint, you can choose from several Esri basemaps hosted on ArcGIS. These basemaps include many options that combine road, aerial, and topographic data with a variety of symbology. If your organization makes them available, you can also access basemaps in your ArcGIS organization.

Clustering

Clustering in ArcGIS Maps for SharePoint refers to grouping point features within a certain distance of each other into one symbol. This is different from grouping in ArcGIS Maps for SharePoint where features are grouped by a user-specified category and styled accordingly.

For more information, see [Configure clustering](#).

Contents pane

The **Contents** pane is a central component of ArcGIS Maps for SharePoint. The **Contents** pane displays the list of layers contained in the map, provides the ability to toggle layer visibility, and provides a starting point for setting layer properties, such as styling, heat maps, transparency, visible range, clustering, and pop-ups.

Coordinate system

Coordinate systems provide a framework for defining real-world locations.

WGS84 is a geographic coordinate system in which every location on the earth is specified by a set of numbers (coordinates).

Coordinates are often expressed as latitude and longitude values. Web Mercator is a projected coordinate system in which locations are identified by x,y coordinates on a grid, with the origin at the center of the grid. Coordinate values in the Web Mercator system generally have 6, 7, or 8 digits to the left of the decimal, and the units are meters. If you are unsure as to which coordinate system you should use, contact the originator of your data or the person who collected it.

Coordinates

A set of values represented by the letters x and y that define a position within a spatial reference. Coordinates are used to represent locations in space relative to other locations. Coordinates are often shown in latitude-longitude pairs, where x coordinates range from -180 to 180 and y coordinates range from -90 to 90, or as values with 6, 7, or 8 digits to the left of the decimal point. When using ArcGIS Maps for SharePoint, these value pairs are often composed of the values from two columns in your data.

Feature

Geographic features are representations of things located on or near the surface of the earth. Geographic features can occur naturally (such as rivers and vegetation), can be constructions (such as roads, pipelines, wells, and buildings), and can be subdivisions of land (such as counties, political divisions, and land parcels). Geographic features are most commonly represented as points, lines, or polygons. In ArcGIS Maps for SharePoint, data you have added is often referred to as features on the map.

Feature service

A feature service is a collection of geographic features. Each feature in the collection has a location, set of properties, map symbology, and pop-up. In ArcGIS Maps for SharePoint, you can search for feature services in ArcGIS and add them to your map. When you add a feature service to your map, it becomes one or more layers in the map.

Grouping

Grouping in ArcGIS Maps for SharePoint is the process of placing features in user-specified categories and styling them accordingly. See [Feature display and style](#) for more information.

Heat map

A heat map represents the geographic density of point features on a map by using colored areas to represent those points. The areas are largest where the most points are concentrated together. See [Add a heat map](#) for more information.

Layer

A layer is the way in which ArcGIS Maps for SharePoint visually represents geographic datasets. A layer can be thought of as similar to a legend item on a paper map. On a road map, for example, roads, national parks, political boundaries, and rivers might be considered different layers. When you add SharePoint data to a map, ArcGIS Maps for SharePoint creates a layer and displays it on the **Contents** pane. Once the layer is created, functionality such as determining visibility, configuring style, and setting transparency are all enabled.

Lines

Lines represent the shape and location of geographic objects too narrow to depict as areas (such as street centerlines and streams).

Map

A map displays geographic data and allows you to explore and interact with that data. In ArcGIS Maps for SharePoint, you can add SharePoint data directly to the map and combine it with additional content from ArcGIS Online.

Map service

A map service is a prestyled collection of map cartography organized by location and scale. In ArcGIS Maps for SharePoint, you can search for map services in ArcGIS and add them to your map. When you add a map service to your map, it becomes one or more layers in the map.

Pan (the map display)

Shift a map image relative to the display window without changing the viewing scale. Panning a map can also be thought of as moving the map image in the display window so you can see different parts of the map.

Points

Points represent discrete locations of geographic features too small to be depicted as lines or areas, such as well locations, telephone poles, and stream gauges. Points can also represent address locations, Global Positioning System (GPS) coordinates, or mountain peaks.

Polygons/Areas

Polygons are enclosed areas (many-sided figures) that represent the shape and location of homogeneous features such as states, counties, parcels, and land-use zones. Polygons are often called areas.

Web map

An ArcGIS web map is an interactive display of geographic information that you can use to tell a story and answer questions. For example, you can create a map that addresses the question, 'How many people in the United States live within a reasonable walk or drive to a supermarket?' The map could contain layers showing neighborhoods within a 10-minute drive or 1-mile walk to a supermarket, and for context, a topographic basemap that includes cities, roads, and buildings overlaid on land cover and shaded-relief imagery. In ArcGIS Maps for SharePoint, you can search for web maps in ArcGIS and add them to your map. When the web map is added to your map, the individual layers in the web map become layers in your map.

Frequently asked questions

- [What are the licensing requirements for ArcGIS Maps for SharePoint?](#)
- [When running the ArcGIS Maps Locate workflow, the fields do not appear on the Choose the columns with location information page.](#)
- [The ArcGIS Maps Locate workflow does not complete successfully when using a custom geocoder and ArcGIS Enterprise.](#)
- [How can I use Esri GeoEnrichment services?](#)
- [How do I connect to services in a firewalled environment?](#)
- [Why does ArcGIS Maps for SharePoint store properties in configuration lists?](#)
- [I created a new site collection within a web application that has ArcGIS Maps for SharePoint, but the components and configuration lists are not available.](#)
- [Can I use existing lists with latitude-longitude data?](#)
- [How do I import Excel spreadsheets for use with ArcGIS Maps for SharePoint?](#)
- [Error message: Your browser configuration does not support sending secured content. Your sign-in was canceled to ensure password safety.](#)
- [In SharePoint 2010, you receive one of the following error messages: An invalid ArcGIS Portal URL was entered. Please verify the URL.Unable to access the authentication service.Your Workflow failed: The underlying connection was closed: Could not establish trust relationship for the SSL/TLS secure channel.Your Workflow failed: Generating request token failed. System.Exception: Generating token request failed.](#)
- [Users who are not signed in to a SharePoint site see a 403 \(Forbidden\) error when trying to view a page that contains an ArcGIS Maps web part.](#)
- [Error message: Could not load file or assembly, Microsoft.SqlServer.Types, Version=11.0.0.0, Culture=neutral, PublicKeyToken=89845dcd8080cc91, or one of its dependencies.](#)

What are the licensing requirements for ArcGIS Maps for SharePoint?

ArcGIS Maps for SharePoint requires an ArcGIS Online organization plan or ArcGIS Enterprise. All users are required to have a Named User license to work with ArcGIS and interact with the map.

While users can view the map as guests without needing to sign in, these users have limited access to the map: in addition to viewing publicly shared ArcGIS Maps for SharePoint content and publicly shared ArcGIS content, guest users can pan and zoom the map, turn layers on and off, and view pop-ups, but most functionality is restricted to viewing only.

When running the ArcGIS Maps Locate workflow, the fields do not appear on the Choose the columns with location information page.

This issue can occur with Portal for ArcGIS 10.2.1 through 10.4.1 on Linux servers. If this occurs, ensure that the geocoding service used is shared with everyone.

The ArcGIS Maps Locate workflow does not complete successfully when using a custom geocoder and ArcGIS Enterprise.

To successfully run the ArcGIS Maps Locate workflow in Portal for ArcGIS 10.3 through 10.4.1 or in ArcGIS Enterprise 10.5 and later, configure the geocoder service according to the [If the service is not from a federated server and requires credentials](#) section in the [Configure utility services](#) topic in your ArcGIS Enterprise documentation.

How can I use Esri GeoEnrichment services?

Esri [GeoEnrichment services](#) provide demographic and contextual data for features in your map. GeoEnrichment requires a subscription to ArcGIS Online or configuration of GeoEnrichment on your installation of ArcGIS Enterprise.

How do I connect to services in a firewalled environment?

See [Configure enterprise logins](#).

Why does ArcGIS Maps for SharePoint store properties in configuration lists?

Some shared properties used across ArcGIS Maps for SharePoint components are stored in lists at the site collection and site level to provide flexibility and ease of use in configuration. Exposing the properties in lists accommodates scenarios where it is appropriate to allow nonadministrative users to configure these properties and scenarios where these should only be editable by administrators. Users of ArcGIS Maps for SharePoint components do not need edit rights to the configuration lists. Additionally, using lists for configuration provides an intuitive, easy-to-use user interface (UI) that will be familiar to most SharePoint users.

I created a new site collection within a web application that has ArcGIS Maps for SharePoint, but the components and configuration lists are not available.

ArcGIS Maps for SharePoint is not automatically activated when you create a new site collection. For new site collections, browse to the **Site Settings** page, click **Site Collection Features**, and activate the ArcGIS Maps for SharePoint feature. This makes all the functionality included with ArcGIS Maps for SharePoint available on the site collection.

Can I use existing lists with latitude-longitude data?

SharePoint lists can contain numerical columns that store the geographic location of each item as latitude and longitude coordinates. To geocode such lists so they can display on the ArcGIS Maps web part, add the ArcGIS Location field to the list and specify the latitude-longitude fields when setting the location field's properties.

How do I import Excel spreadsheets for use with ArcGIS Maps for SharePoint?

See [Prepare SharePoint data](#) for information on importing Excel spreadsheets to SharePoint.

Error message: Your browser configuration does not support sending secured content. Your sign-in was canceled to ensure password safety.

This happens when using an older version of Internet Explorer (IE8) that uses a proxy page hosted through http (as is done with ArcGIS Maps for SharePoint). ArcGIS Maps for SharePoint provides a configuration setting, **AllowSignInOverHttpProxy**, which is set to **False** by default. This setting prevents the user's password from being transmitted over http, which is not secure, instead of https. This setting can be changed to **True** if it is acceptable to send a password over http instead of https. To access this page, type the following URL in your browser's address field: <your site collection root>/lists/esri maps configuration settings.

In SharePoint 2010, you receive one of the following error messages:

- An invalid ArcGIS Portal URL was entered. Please verify the URL.
- Unable to access the authentication service.
- Your Workflow failed: The underlying connection was closed: Could not establish trust relationship for the SSL/TLS secure channel.
- Your Workflow failed: Generating request token failed. System.Exception: Generating token request failed.

This error message is specific to SharePoint 2010 and is the result of a certificate error in SharePoint. To resolve this error message, download the certificate and add it to the SharePoint server using the steps below:

Download the certificate

 **Note:** You may need elevated permissions (Run As Administrator) to copy the certificate.

1. Browse to <https://www.arcgis.com> (or the portal you are using). Ensure you use https.
2. Click the **Security Report** icon (padlock) in the URL address bar.
3. Click **View certificates** on the **Website Identification** window that appears.
4. Click the **Certification Path** tab on the **Certificates** window.
5. Select **DigiCert** and click **View certificate**.
Important: Be sure to select the root certificate (DigiCert), not one of the sub-entries; you need the entire contents of the package.
6. Click the **Details** tab on the **Certificates** window.
7. Click **Copy to File** to start the **Certificate Export Wizard**.
8. On the first page of the **Certificate Export Wizard**, click **Next**.
9. Select the **Base-64 encoded X.509 (.cer)** option and click **Next**.
10. Save the file to a known location on disk and click **Next** on the **Certificate Export Wizard**.
11. Click **Finish**. A message appears stating that the export was successful.

Import the certificate to SharePoint

1. Open SharePoint Central Administration in a browser, with elevated permissions (Run As Administrator).
2. Click **Security** and click **Manage Trust** under the **General Security** heading.
3. Click **New**, specify a name, and browse to the root certificate you saved in the previous steps.
 **Note:** Do not delete the existing local certificate.
4. Click **OK**. The certificate is now added to the SharePoint server instance.

Users who are not signed in to a SharePoint site see a 403 (Forbidden) error when trying to view a page that contains an ArcGIS Maps web part.

If you have a public-facing site collection that doesn't require users to sign in, if pages within that site collection contain ArcGIS Maps web parts, you must enable anonymous access for the SharePoint site, and enable ArcGIS Maps guest access for users to be able to view the map.

 **Tip:** As a best practice, it is recommended that you use a dedicated SharePoint web application to serve public-facing site collections.

To enable anonymous access in your SharePoint site collection, do the following:

- Enable SharePoint anonymous access on the web application level
- Enable SharePoint anonymous access on the site collection level

Enable SharePoint anonymous access on the web application level

You must be a SharePoint farm administrator to complete these tasks.

1. From SharePoint Central Administration, under **Application Management**, click **Manage Web Applications**. The **Web Applications** page opens, listing available applications.
2. From the list, click the web application for which you want to enable anonymous access and, on the ribbon, click **Authentication Providers**. A window appears, showing the authentication providers available per zone. In a basic scenario, only the Default zone is listed.
3. Click **Default**. The **Edit Authentication** window opens.
4. Check the **Enable Anonymous Access** checkbox and clear the **Require Use Remote Interfaces permissions** box if it is checked.
5. Scroll to the bottom of the window and click **Save**. Close the Edit Authentication window and exit SharePoint Central Administration.
6. Open SharePoint Management Shell with elevated permissions (Run as Administrator).
7. To allow users to add SharePoint data to an ArcGIS Maps web part, run the following script, replacing the values in brackets with the URL of your web application:

```
$webapp = Get-SPWebApplication <"http://myWebApplication">
$webapp.ClientCallableSettings.AnonymousRestrictedTypes.Remove ([microsoft.sharepoint.spweb], "GetSebwebsForCurrentUser")
$webapp.ClientCallableSettings.AnonymousRestrictedTypes.Remove ([microsoft.sharepoint.splist], "GetItems")
$webapp.ClientCallableSettings.AnonymousRestrictedTypes.Remove ([microsoft.sharepoint.splist], "GetChanges")
$webapp.Update ()
```

Enable SharePoint anonymous access on the site collection level

You must be a SharePoint site collection administrator to complete these tasks.

1. Navigate to one of the site collections you created under the configured web application and open the **Site Settings** page.
- 2.
3. Under the Users and Permissions section, click **Site permissions**.
4. From the ribbon, click **Anonymous Access**. The Anonymous Access configuration window opens.
5. From the **Anonymous users can access** options, choose **Entire Web Site**.
6. Clear the **Require Use Remote Interfaces permission** check box and click **OK**. A new group named **Anonymous Users** appears on the site permissions list. After these configurations are complete, anonymous users that are unknown to both SharePoint and ArcGIS will be able to view ArcGIS Maps.

Error message: Could not load file or assembly, Microsoft.SqlServer.Types, Version=11.0.0.0, Culture=neutral, PublicKeyToken=89845dcd8080cc91, or one of its dependencies.

When running the workflow to connect to external data, you may encounter the error message, Could not load file or assembly Microsoft.SqlServer.Types, Version=11.0.0.0, Culture=neutral, PublicKeyToken=89845dcd8080cc91, or one of its dependencies. This error message occurs on systems with SQL Server 2008, which does not always provide version 11 of the Microsoft.SqlServer.Types assembly. This error message should only occur with SharePoint 2010. Follow the steps below to install version 11 of the Microsoft.SqlServer.Types assembly to the Global Assembly Cache (GAC) of the SharePoint server machine.

1. Download the Microsoft SQL Server 2012 SP1 Feature Pack from <http://www.microsoft.com/en-us/download/details.aspx?id=35580>.

2. When prompted to choose the download, select `ENU\x86\SQLSysClrTypes.msi` or `ENU\x64\SQLSysClrTypes.msi`, depending on whether the server is 32 bit (x86) or 64 bit (x64).
3. Save the file to the server machine and run it.
4. Restart IIS.

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