

# Unlock Worldwide Resources with ArcGIS

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## What You Will Need

- ArcInfo 8.1, ArcEditor 8.1, or ArcView 8.1
- An Internet connection

**Editor's Note:** Data integration has long been recognized as one of the great strengths of GIS. Organizations worldwide have spent billions of dollars synthesizing and integrating spatial data for internal use. The Geography Network ([www.geographynetwork.com](http://www.geographynetwork.com)) provides a portal that unlocks these vast resources by allowing simple, real-time, remote access to this data through the use of ArcGIS.

ArcIMS, one part of ArcGIS, provides an easy way to publish maps, geographic data, and spatial applications on the Internet. An article in the October–December 2000 issue of *ArcUser* magazine, “Creating a GIS-Enabled Web Site Using ArcIMS,” walked readers through the simple three-step process of setting up an ArcIMS site and publishing a Map Service.

ArcCatalog and ArcMap, two of the desktop applications in ArcGIS, can work with data from ArcIMS services in the same manner as data stored locally or on a local network. ArcCatalog explores and manages Internet data sources, and ArcMap displays and analyzes data. This article describes how to take advantage of connectivity with the Geography Network that is built into ArcCatalog and ArcMap. Although the Geography Network includes many types of content, this tutorial focuses on using ArcCatalog and ArcMap to access ArcIMS Map Services.

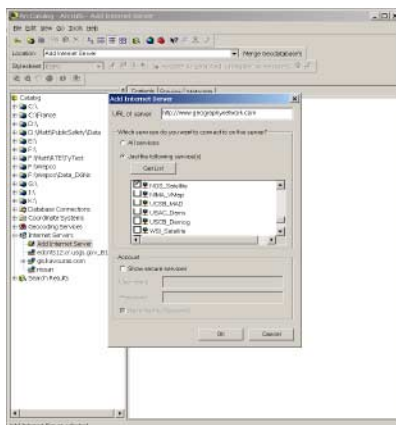
these layers are only visible at a preset scale). Layers and sublayers can be turned on and off. When using image and Feature Services, it is a good idea to investigate the sublayers and turn off ones that visually conflict with other data in the data frame. Hide a sublayer by clicking on the dash in front of the layer name in the Table of Contents.

A connection to the Geography Network server or other Internet map servers can be created in ArcCatalog to browse available data. Once an Internet server connection is added to ArcCatalog, all the Map Services available from that server are visible. This connection can be renamed with a more meaningful name, deleted, or disconnected. Simply drag and drop a Map Services icon from ArcCatalog to ArcMap to start that service in ArcMap or choose File > Add Data or click on the Add Data button to add Internet server connections. ArcMap has a built-in connection to the Geography Network. Choose File > Geography Network to access the Geography Network Explorer and browse available Map Services to locate data that can be added as layers.

## Adding Map Services Using ArcCatalog

ArcCatalog must be connected to a map server before it can access Map Services. This next step will establish a connection to the Geography Network Internet server and access shaded relief raster data. This type of data is typically used for geographic reference or as a background for displaying other data.

1. Start ArcCatalog. The catalog tree on the left side of the ArcCatalog window lists the connections currently available.
2. Scroll to the bottom of the catalog tree and expand the entry for Internet Servers by clicking on the plus sign in front of it. Double-click on Add Internet Server to display the Add Internet Server dialog.
3. In this dialog, next to “URL of server” type “www.geographynetwork.com” and make sure that “Just the following services” is selected in the “What services do you want to connect to on this server?” section. To access all available services in one step, choose “All services.” Click on the Get List button. The text box will display all available services. Click on the NGS\_Satellite Internet map server to add it to the list of



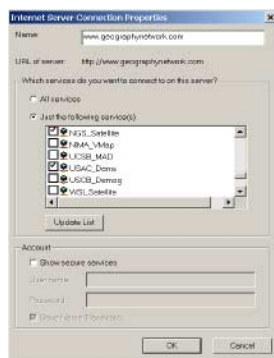
In ArcCatalog, add the Geography Network as an Internet server and connect to the NGS\_Satellite Map Service.

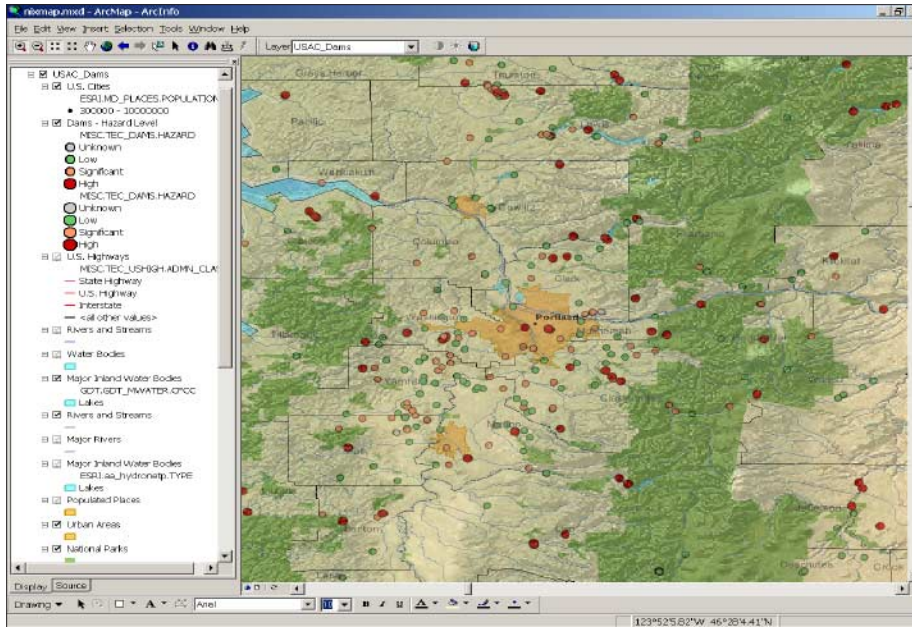
## What Is a Map Service?

A Map Service is a “live” map that is published over the Internet using ArcIMS. The map publisher defines the data that will be included and determines the map’s geographic extent, symbology, and functionality. A Map Service can contain one or many data layers such as street networks or city points. There are two types of Map Services—Image Services and Feature Services. An Image Service is a snapshot of a map on a server that is delivered as an image and often used as a background for existing local data. A Feature Service provides more sophisticated functionality by streaming actual map features that are directly accessible by ArcMap. Characteristics such as drawing order can be changed. Data provided by a Feature Service can be used for analysis. ArcCatalog and ArcMap can access both Feature and Image Map Services.

Typically, both Image and Feature Services consist of one layer composed of many sublayers. Sublayers can be scale-dependent (i.e.,

From the list of map services offered on the Geography Network Internet server add a connection to the USAC\_Dams USAC\_Dams Internet Service.





Access a World of Information at  
the Geography Network.  
[www.geographynetwork.com](http://www.geographynetwork.com)

*Zoom in to Portland, Oregon.  
More detailed sublayers are  
revealed as the scale of the map  
display becomes larger.*

- connections in the catalog tree.
- Now add another Map Service, also located on the Geography Network, that supplies data from the United States Army Corps of Engineers showing the location of dams. In the catalog tree, right-click on the [www.geographynetwork.com](http://www.geographynetwork.com) Internet Service to bring up the context menu and choose Properties. In the Internet Server Connection Properties dialog box, scroll down and click on the box next to the USAC\_Dams service. Click OK to dismiss the dialog.
- Return to the catalog tree and expand the [www.geographynetwork.com](http://www.geographynetwork.com) folder.

### Viewing Map Services in ArcMap

One of the most powerful features of ArcMap is the ability to view more than one Map Service at a time, even if these services are located on different servers in different parts of the world. Both Image Services that were previewed in ArcCatalog in the previous steps will be added to ArcMap.

- Start ArcMap and create a new map.
- Move and/or resize the ArcCatalog and ArcMap windows so both are visible.
- In the ArcCatalog catalog tree, select the NGS\_Satellite in the expanded [www.geographynetwork.com](http://www.geographynetwork.com) map server folder and drag it into the ArcMap display area. Once added to ArcMap, this data appears in the Table of Contents as a layer containing several sublayers. Click on the box next to the layer to display it. Choose View > Full Extent to see the entire map.
- In the ArcCatalog catalog tree, select the USAC\_Dams Map Service in the [www.geographynetwork.com](http://www.geographynetwork.com) map server folder. Drag it into the ArcMap display area.

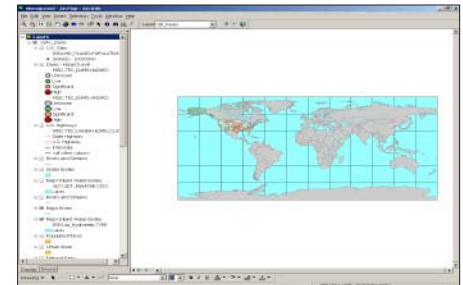
### Inspecting the Layers

With both Image Services in ArcMap, the next step is to zoom in on the Portland, Oregon, metropolitan area. Notice that not all the sublayers in both layers are turned on. Sublayers that have grayed-out check boxes in the Table of Contents are scale-dependent. Right-click on a layer with the grayed check box to bring up the context menu and choose Properties. Choose the General tab in the Properties dialog to see the minimum and maximum scale range for that layer. Choose the Sources tab to view information on the layer's coordinate system.

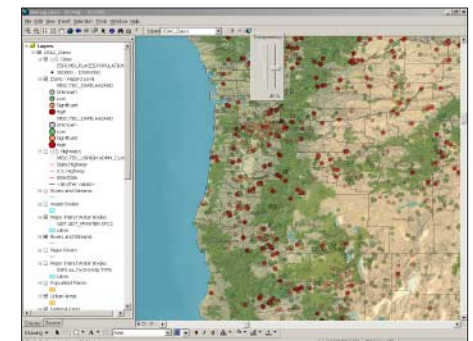
- Choose the Zoom In button and click on the state of Oregon to zoom in on it. Continue to zoom in to the Portland area until the map scale is less than 1:2,000,000. Notice the status bar—each time the display refreshes, data is being requested from the map servers.
- To see the satellite data beneath the USAC\_Dam data layer, the dam layer must be made transparent. Transparency is useful for making underlying features visible when displaying multiple layers on a map. Choose View > Toolbars > Effects to display the Effects toolbar.
- In the Effects toolbar, click the Layer drop-down arrow and choose USAC\_Dams as the layer to adjust. Click the Adjust Transparency button and drag the slider bar to adjust the transparency to 45 percent. Now the satellite data is visible through the semitransparent USAC\_Dam layer.

### Adding and Modifying Data from a Feature Service

Map Services can also be added directly to ArcMap from the Geography Network

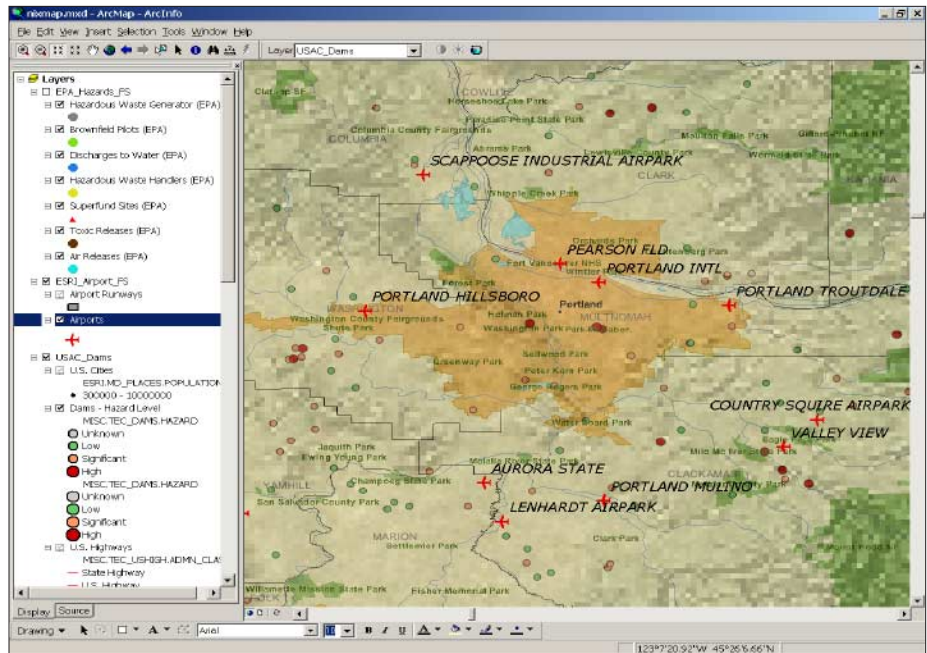


*Add the USAC\_Dams Map Service connection as another layer in ArcMap.*



*Use the Effects toolbar to adjust the transparency of the USAC\_Dams layer.*

# Unlock Worldwide Resources with ArcGIS



Select the *ESRI\_Airport\_FS* layer and right-click on it to bring up the context menu to toggle on the airport labels.



Use the Geography Network Explorer to find the ESRI NIMA Airport Locations Feature Service and then add it to ArcMap.

without connecting to an Internet server using ArcCatalog. A Feature Service will be added directly to ArcMap in this step.

1. From ArcMap, choose File > Add Data from Geography Network. The Geography Network Explorer is displayed.
2. In the Define Search Criteria for Data Theme section, scroll to Transportation Data, located under Business Data, and select it. Click on Search. Search results are displayed on the right.
3. Scroll to the ESRI NIMA Airport Locations Feature Service and select it. Be careful to choose the Feature Service rather than the ESRI NIMA Airport Locations Image Service. Click the Add to ArcMap button to add it to this map document.
4. Dismiss the message box concerning the difference in coordinate systems by clicking OK. For the purposes of this tutorial, projection differences are not consequential.
5. The ESRI NIMA Airport Locations layer will be listed as *ESRI\_Airport\_FS* in the Table of Contents. Unlike an Image Service, the symbology in the *ESRI\_Airport\_FS* layer can be changed and the features used for analysis.
6. ArcMap can be used to change the symbology used by a Feature Services layer so that it will be more legible or work with other layers from different sources that are being analyzed.
7. In the Table of Contents, click on the airfield symbol to display the Symbol Selector.
8. Scroll through the symbols and choose an airplane symbol by clicking on it. Change

its color by clicking on the arrow next to the color swatch under Options. In the displayed palette, choose a shade of red to change the color of the airplane symbol and click OK. In the Table of Contents, right-click on the *ESRI\_Airport\_FS* layer and toggle on Label Features.

This map can be saved so that when it is reopened ArcMap will automatically reconnect to the Map Services. Choose File > Save As and save the map document as portland.mxd to a local drive before closing ArcMap and ArcCatalog.

Connecting to the Geography Network using ArcMap and ArcCatalog instantly expands your GIS and makes a growing library of data and services accessible from the desktop. To learn more about the Geography Network or to search for Map Services visit [www.geographynetwork.com](http://www.geographynetwork.com). In addition, ESRI Instructor-led and Virtual Campus courses include instruction for integrating the Geography Network with GIS software.

Find out more about these courses by visiting [www.esri.com/training](http://www.esri.com/training).