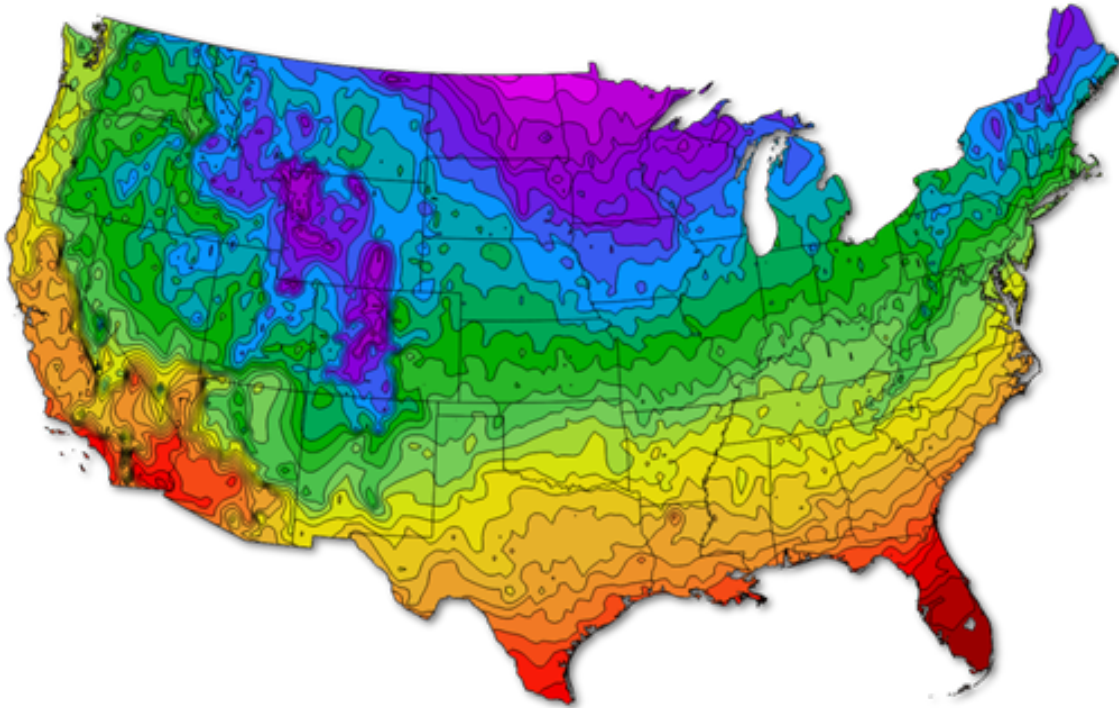




Accessing the HPRCC GeoServer

Accessing GIS products at the High Plains Regional Climate Center is now easier than ever! The HPRCC GeoServer enables users to connect directly to shapefile data without the hassle of manually downloading the latest datasets. This tutorial will show you how to connect to the GeoServer with ESRI ArcGIS and the open source QGIS.



Example of GIS Product Capabilities

WMS and WFS

Web Map Service (WMS) protocols will load image tiles of the shapefile into your GIS platform. WMS protocol allows you to see HPRCC data in GIS similar to how you would see it on our ACIS climate maps. This is great for data with discrete stylings, such as contoured maps.

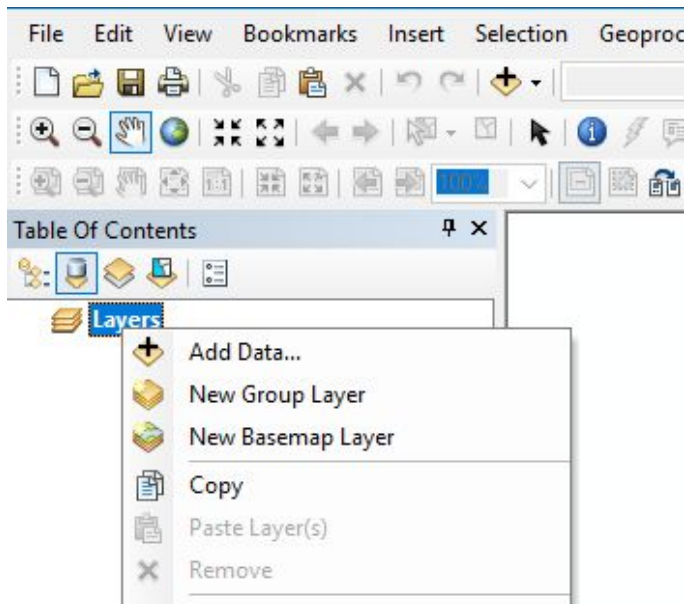
Web Feature Service (WFS) protocols will load the raw data into ArcMap for you to interact with. You will be able to interact with each feature value, but the user is responsible for customizing their own maps. This works great for point data, where you need reported values. To use WFS in ArcGIS, you will need the Data Interoperability extension. The "Adding WFS Layers to ArcMap" section provides information on how to enable this extension.



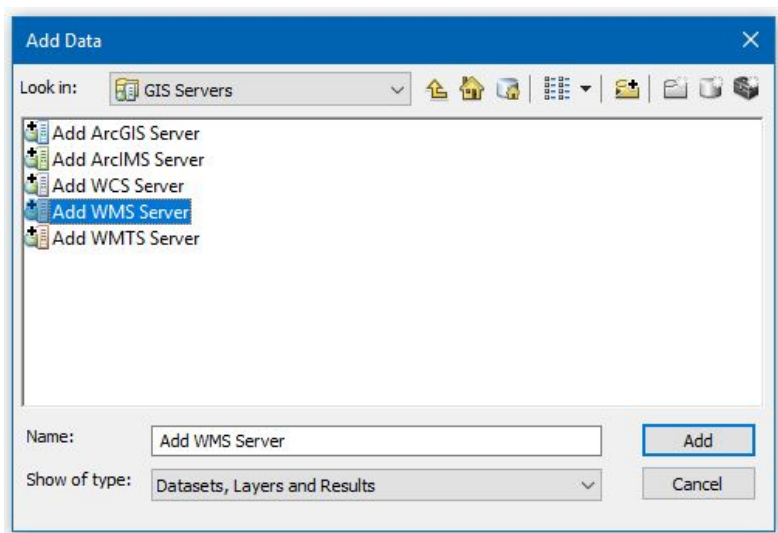
Accessing the HPRCC GeoServer

Adding WMS Layers to ArcMap

1. Open ArcMap.
2. Right-click in Layers and click **Add Data...**



3. In the Add Data dialog, click the **Look in** drop down box and select **GIS Servers**.
4. Select **Add WMS Server**.





Accessing the HPRCC GeoServer

5. In the **Add WMS Server** dialog, enter <http://hprcc.unl.edu/geoserver/ACIS/wms> into the URL text box.
6. Click the **Get Layers** button. You should see a tree below full of HPRCC products. Click OK.

The 'Add WMS Server' dialog box is shown. The URL field contains 'http://hprcc.unl.edu/geoserver/ACIS/wms?'. Below the URL field are examples and a version dropdown set to 'Default version'. A 'Custom Parameters' section has a table with 'Parameter' and 'Value' columns. The 'Server Layers' section has a 'Get Layers' button. Below it is a tree view showing 'HPRCC WMS Service' expanded, listing various precipitation layers. To the right of the tree, details for the selected layer are shown: Name: WMS, Version: 1.3.0, and Abstract: A WMS Service of High Plains Regional Climate Center GIS products. At the bottom are 'Account (Optional)' fields for User and Password, and 'OK' and 'Cancel' buttons.

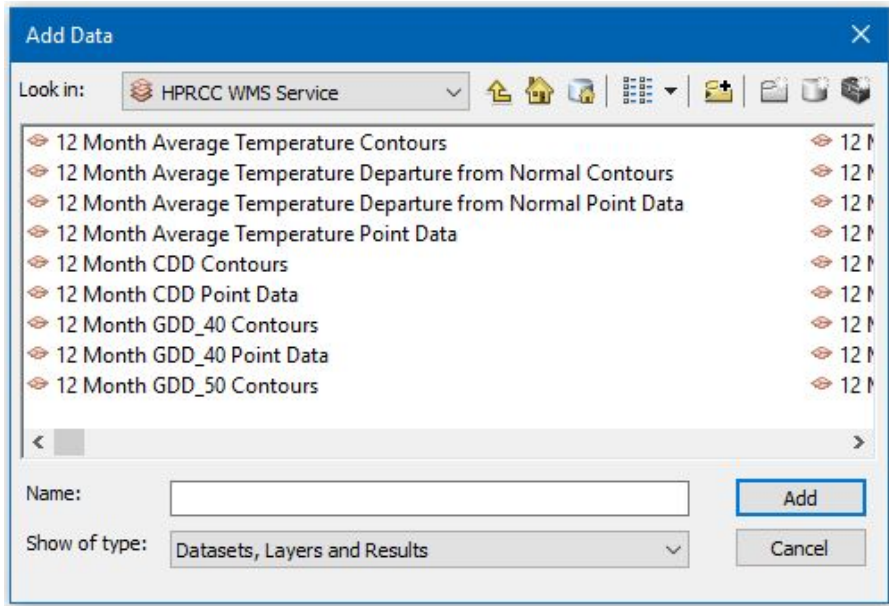
7. You should see a new server added to the **Add Data** dialog. You may change the server name by highlighting the server and clicking once on the name.

The 'Add Data' dialog box is shown. The 'Look in:' dropdown is set to 'GIS Servers'. Below it is a list of servers: 'Add ArcGIS Server', 'Add ArcIMS Server', 'Add WCS Server', 'Add WMS Server', 'Add WMTS Server', and 'HPRCC WMS Service on hprcc.unl.edu'. The last item is highlighted. At the bottom, the 'Name:' field contains 'HPRCC WMS Service on hprcc.unl.edu', and the 'Show of type:' dropdown is set to 'Datasets, Layers and Results'. 'Add' and 'Cancel' buttons are at the bottom right.



Accessing the HPRCC GeoServer

8. Double click the new server.
9. Double click **HPRCC WMS Service** twice.
10. Select the products you wish to add.



11. You should now see the new layer listed in your Table of Contents. If you click the '+' symbol next to the product name you will see the key for the layer.



Accessing the HPRCC GeoServer

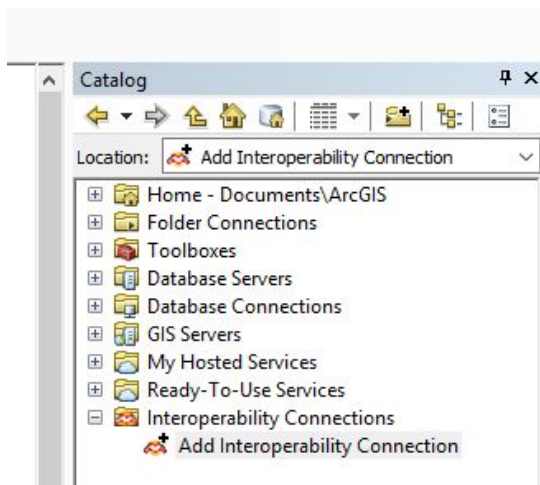
Adding WFS Layers to ArcMap

Before using the WFS protocol, make sure the Data Interoperability extension is installed. To verify that you have a license for this extension, open **ArcGIS Administrator**, and look under **Availability**. The **Authorized** column indicates if you are authorized to use the extension. The **Installed** column indicates if you have the extension installed. If it says **No** under the **Installed** Column, you will need the ArcGIS installation CD to install the extension.

To install the Interoperability extension, insert the installation CD and run the auto installer. When the installer opens, click the **Modify** button. Expand the **Extensions** menu and then select the extension you'd like to install. Check '**Entire feature will be installed on local hard drive**' for each extension you need to install. Your individual site installation method may differ, consult the individual managing your ArcGIS license for information about installing the extension.

Once you have installed the Data Interoperability extension, it will need to be activated. Open ArcMap and navigate to **Tools** → **Extensions** (in some versions it may be **Customize** → **Extensions**), and make sure **Data Interoperability** is checked. Once completed, you will be ready to add a WFS data source!

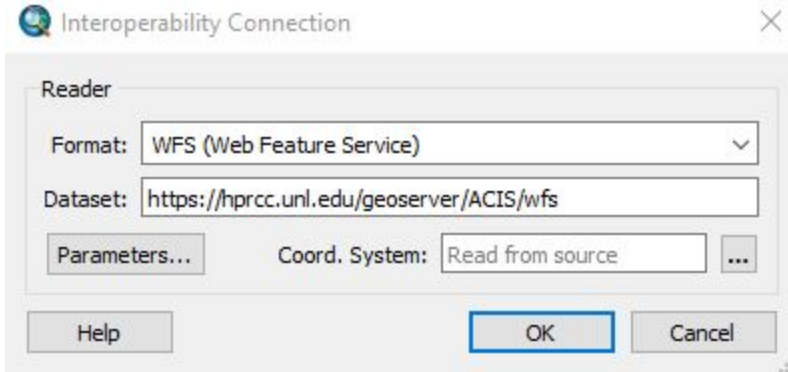
1. At the top of ArcMap window, click on **Windows** → **Catalog**.
2. You should now see the **Catalog** panel at the right of your screen. Expand the **Interoperability Connections** folder.
3. Double click on **Add Interoperability Connection**. The **Interoperability Connection** dialog should appear.



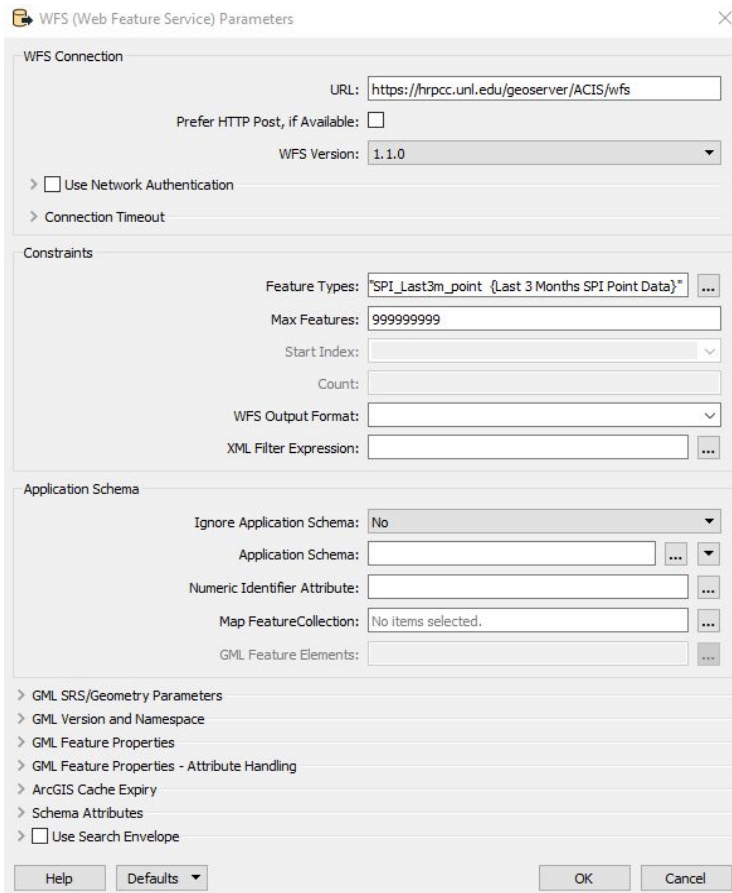


Accessing the HPRCC GeoServer

4. Open the **Format** drop down and select More Formats...
5. In the new window, select **WFS (Web Feature Service)** and click OK.
6. In the **Dataset** box type: <https://hprcc.unl.edu/geoserver/ACIS/wfs>



7. Click the **Parameters...** button.
8. Select WFS Version 1.1 under the **WFS Version** dropdown.
9. Enter the number 999999999 into the **Max Features** dialog box.





Accessing the HPRCC GeoServer

10. Click the ... button next to **Feature Types**.



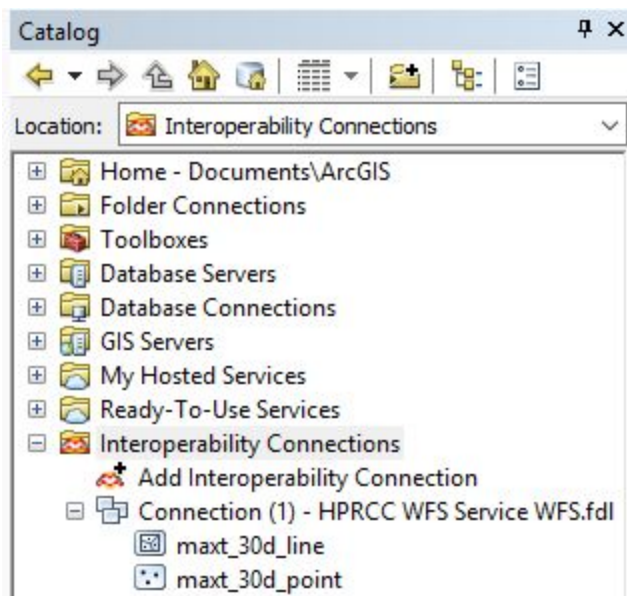
11. Select several products you wish to regularly use through WFS and click OK.

Note: Even with the maximum number of features set to 999999999 you cannot add all of HPRCC's WFS products at one time.

12. Click OK in the **WFS Parameters** window.

13. Click OK in the **Interoperability Connection** window.

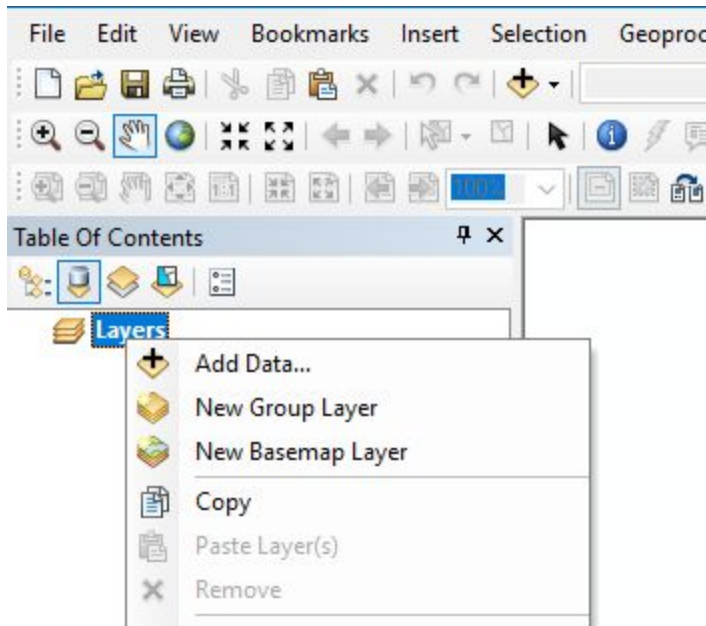
14. You should now see a new connection under Interoperability Connections in the **Catalog** panel. You may rename the connection by right-clicking on it and selecting **Rename**. You are now ready to add a layer to your map.





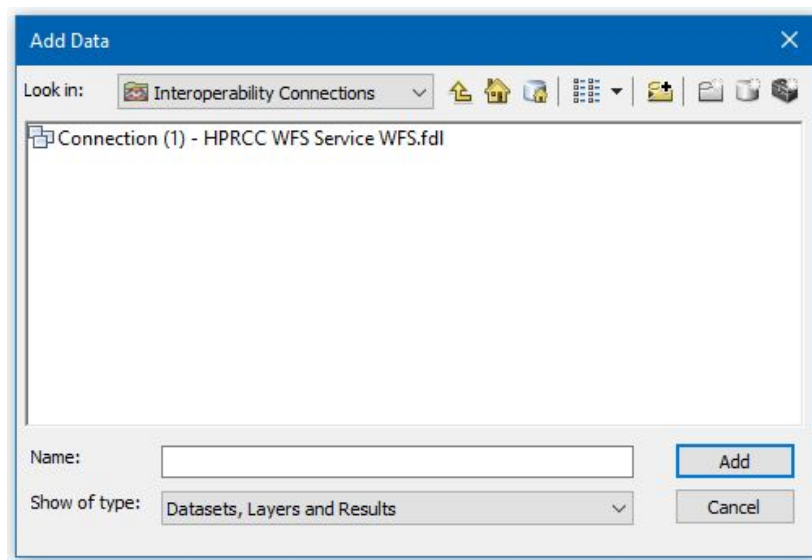
Accessing the HPRCC GeoServer

15. Right-click in a layer and select **Add Data**.



16. In the drop-down at the top of the dialog, select **Interoperability Connections**.

17. Select the connection you made earlier and click **Add**.



18. All of the layers you selected earlier should now be on your map.



Accessing the HPRCC GeoServer

Adding WMS Layers to QGIS

1. Open QGIS and a basic map.
2. On the left panel, select **Add WMS/WMTS Layer**. Or go to **Layer**→ **Add Layer**→ **Add WMS/WMTS Layer**.
3. In the new window, click the **New** button. You are now adding a new WMS connection.
4. In the Create a new WMS connection dialog, type <https://hprcc.unl.edu/geoserver/wms> into the **URL** textbox. Type a name for this connection into the **Name** box. Press OK.
5. Click the **Connect** button. You should now see a list of products available. Select the layers you wish to add and press the **Add** button.

Adding WFS Layers to QGIS

1. Open QGIS and a basic map.
2. On the left panel, select **Add WFS Layer**. Or go to **Layer**→ **Add Layer**→ **Add WFS Layer**.
3. In the new window, click the **New** button. You are now adding a new WFS connection.
4. In the Create a new **WFS Connection** dialog, type <https://hprcc.unl.edu/geoserver/ACIS/wfs> into the **URL** textbox. Type a name for this connection into the **Name** box. Press OK.
5. Click the **Connect** button. You should now see a list of products available. Select the layers you wish to add and press the **Add** button.



Accessing the HPRCC GeoServer

Common Problems

Here are a few tips to solve common problems with the shapefiles service:

ArcMap sees the WFS layer, but won't load it!

This problem is most likely caused by the max feature count setting. This can be adjusted by re-adding the WFS service and changing this setting to a very high number. You can also create several smaller WFS service groups containing subsets of layers.

Departure maps/SPI aren't displaying high values!

This is most likely a rendering order issue caused by the diverging scale.

To fix this in ArcMap:

1. Open the **Layer Properties**
2. Select **Display**
3. Enter the **Display Expression** as ABS(level)

In QGIS:

1. Open the **Layer Properties**
2. Select the **Style** tab
3. Expand the **Layer Rendering Control Group** at the bottom of the window
4. Select **Control Feature Rendering Order** and enter **abs(level), Ascending, NULLs Last**