

QGIS: Adding WMS Layers

QGIS 2.18.2

Welcome to the Essential ArcGIS Task Sheet Series. This series supplements the Iowa State University GIS Geospatial Technology Training Program short course series, “Essential ArcGIS Tutorial Series.” The task sheets are designed to provide quick, easy instructions for performing specific tasks in GIS.

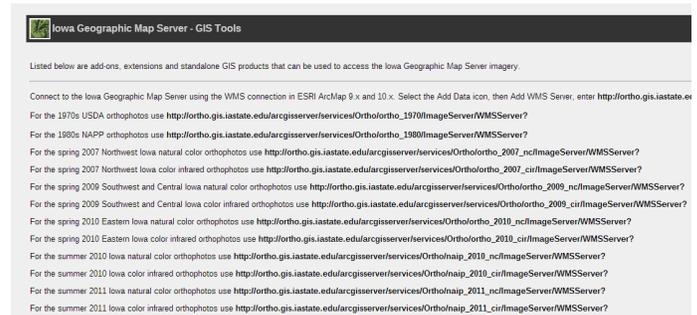
Web Map Service (WMS) layers are map layers that are streamed over the web. These layers can range from imagery to map coverages and anything in-between. There are several advantages to using this type of layer over downloading data and storing it on your local machine. For one, high resolution imagery usually has a very large file size which can quickly use up memory on a local machine. WMS layers are usually updated by the publisher, giving you the most up-to-date layer without having to download it again. Secondly, using a WMS layer for imagery gives you a seamless image between counties boundaries. Seamless images are important because there is not always exact alignment between county boarders when downloading imagery on a county by county basis. An important high speed Internet connection is needed when using a WMS layer in order to view the layer quickly. This task sheet will demonstrate how to connect to WMS layers using QGIS and show you the difference between a seamless and a seamed image.

1. WMS layers for Iowa and the U.S.

- The Iowa Geographic Map Server provides current and historic statewide imagery at http://ortho.gis.iastate.edu/IGMS_WMS.html.
- The Iowa Environmental Mesonet provides weather data for Iowa and the U.S. (such as precipitation, and visible and infrared imagery) at <http://mesonet.agron.iastate.edu/ogc/>.

2. Add WMS Layer

- Open QGIS. Click on the **Add WMS layer** icon.  This will bring up the **Add layer(s) from a WM(T) Server** window.
- In the **Add layer(s) from a WM(T) Server** window, click on the **New** button in the upper left corner near the **Connect** button. The **Create a new WMS connection** window will open.
- In the **Name** box type: **Iowa 2015 Summer Natural Color** and in the **URL** box below enter in this link: http://ortho.gis.iastate.edu/arcgis/services/ortho/naip_2015_nc/ImageServer/WMServer?request=GetCapabilities&service=WMS Click the **OK** button to close the **Create a new WMS connection** window.
- Click **Connect** in the **Add layer(s) from a WM(T) Server** window, and **naip_2015_nc** will be added to the box below. Click on the layer name to select it, then click **Add**. The layer should now appear on your map and in your **Layer Panel**.



Iowa Geographic Map Server - GIS Tools

Listed below are add-ons, extensions and standalone GIS products that can be used to access the Iowa Geographic Map Server imagery.

Connect to the Iowa Geographic Map Server using the WMS connection in ESRI ArcMap 9.x and 10.x. Select the Add Data icon, then Add WMS Server, enter <http://ortho.gis.iastate.edu>

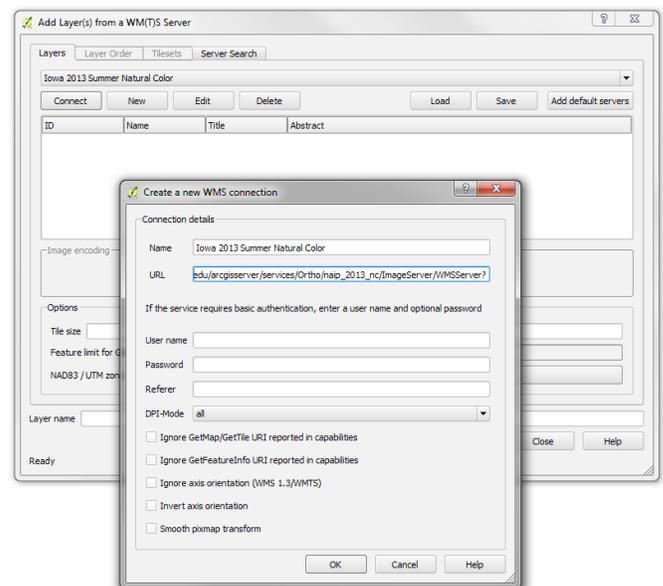
- For the 1970s USDA orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Orthoortho_1970/ImageServer/WMServer?
- For the 1980s NAPP orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Orthoortho_1980/ImageServer/WMServer?
- For the spring 2007 Northwest Iowa natural color orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Orthoortho_2007_nc/ImageServer/WMServer?
- For the spring 2007 Northwest Iowa color infrared orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Orthoortho_2007_cir/ImageServer/WMServer?
- For the spring 2009 Southwest and Central Iowa natural color orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Orthoortho_2009_nc/ImageServer/WMServer?
- For the spring 2009 Southwest and Central Iowa color infrared orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Orthoortho_2009_cir/ImageServer/WMServer?
- For the spring 2010 Eastern Iowa natural color orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Orthoortho_2010_nc/ImageServer/WMServer?
- For the spring 2010 Eastern Iowa color infrared orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Orthoortho_2010_cir/ImageServer/WMServer?
- For the summer 2010 Iowa natural color orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Ortho/naip_2010_nc/ImageServer/WMServer?
- For the summer 2010 Iowa color infrared orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Ortho/naip_2010_cir/ImageServer/WMServer?
- For the summer 2011 Iowa natural color orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Ortho/naip_2011_nc/ImageServer/WMServer?
- For the summer 2011 Iowa color infrared orthophotos use http://ortho.gis.iastate.edu/arcgisserver/services/Ortho/naip_2011_cir/ImageServer/WMServer?

Web Map Service (WMS)

A WMS defines a protocol for web based retrieval of geodata in raster map format. If you are interested in "VERSION=1.1.1&REQUEST=GetCapabilities&SERVICE=WMS" to the URI string.

Services

- Iowa Precipitation
<http://mesonet.agron.iastate.edu/cgi-bin/wms/iowa/rainfall.cgi?>
- MRMS Q3 Precipitation
<http://mesonet.agron.iastate.edu/cgi-bin/wms/us/mrms.cgi?>
Layer: **mrms_p24h** 24 Hour Precipitation
Layer: **mrms_p1h** One Hour Precipitation
- CONUS GOES Infrared Satellite
http://mesonet.agron.iastate.edu/cgi-bin/wms/goes/conus_ir.cgi?



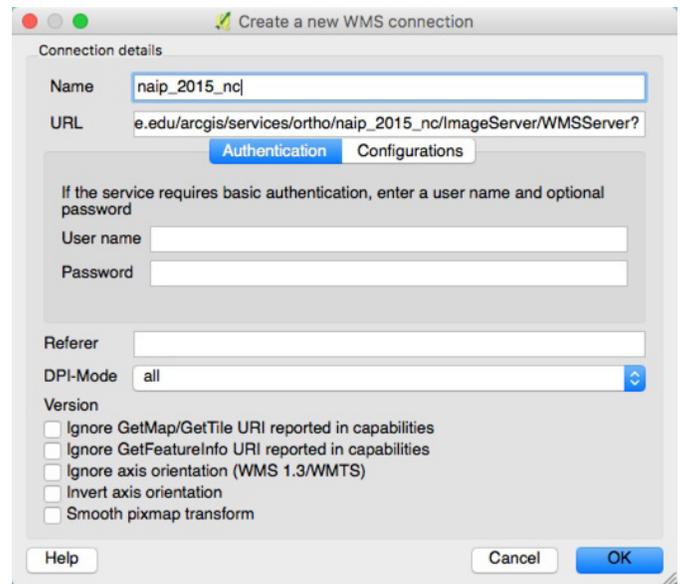
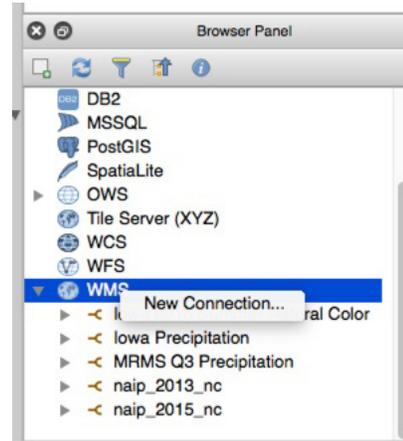
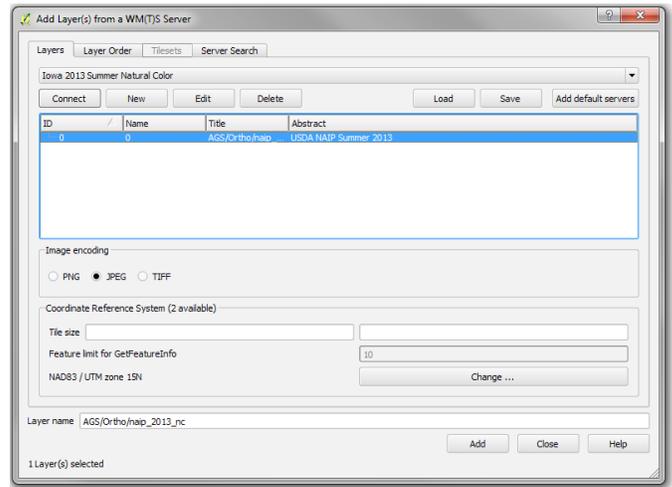
The screenshot shows the 'Add Layer(s) from a WM(T) Server' dialog box in QGIS. The 'Layers' list contains 'Iowa 2013 Summer Natural Color'. A 'Create a new WMS connection' dialog box is overlaid on top, showing the following details:

- Name:** Iowa 2013 Summer Natural Color
- URL:** http://ortho.gis.iastate.edu/arcgisserver/services/Ortho/naip_2013_nc/ImageServer/WMServer?request=GetCapabilities&service=WMS
- User name:** (empty)
- Password:** (empty)
- Referer:** (empty)
- DPI-Mode:** all
- Ignore GetMap/GetTile URI reported in capabilities
- Ignore GetFeatureInfo URI reported in capabilities
- Ignore axis orientation (WMS 1.3/WMTS)
- Invert axis orientation
- Smooth pixmap transform

- e. An alternative method for adding WMS layers in QGIS is to right-click on **WMS** from the **Browser Panel** and click **New Connection...** to open the **Create new WMS connection** window. Follow **step 2c** to add the WMS connection. *Hint: try this WMS layers from the Iowa Mesonet.*

4. Seamless Image vs. Seamed Image

- a. Compare the two images below. You can see that the top image smoothly flows from Mahaska County to Keokuk County without any interruption in the image. This represents the WMS layer **Iowa 2015 Summer Natural Color** from the Iowa Geographic Map Server.
- b. In the second image you can see a large black bar cutting between the two counties. This represents what might happen if you download aerial imagery from the NRGIS by county and the county boundaries in the imagery don't quite line up. *Hint: the NRGIS stands for the Iowa National Recourses Geographic Information Systems Library <http://www.igsb.uiowa.edu/nrgislibx/>.*
- c. This is one of the benefits of using a WMS layer for imagery rather than downloading and stitching together your imagery by county.



Contact:

Amy Logan amylogan@iastate.edu, 515 294 0980 for QGIS specific questions. Bailey Hanson bahanson@iastate.edu, 515-520-1436 or Professor Christopher J. Seeger, ASLA, GISP cjseeger@iastate.edu, 515-509-0651 for more information about the Geospatial Technology Program. This task sheet and more are available at www.extension.iastate.edu/communities/gis

Iowa State University Extension and Outreach does not discriminate on the basis of age, disability, ethnicity, gender identity, genetic information, marital status, national origin, pregnancy, race, religion, sex, sexual orientation, socioeconomic status, or status as a U.S. veteran. (Not all prohibited bases apply to all programs.) Inquiries regarding non-discrimination policies may be directed to Ross Wilburn, Diversity Officer, 2150 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, 515-294-1482, wilburn@iastate.edu.