Connecting to the Oregon Imagery Explorer Web Map Service (WMS)

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Oregon Imagery EXPLORER

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Disclaimer

Lossy compression of imagery degrades images to some degree (USDA, 2006.) Therefore the imagery from the web map service, which has undergone ER Mapper Compressed Wavelet (ECW) 18:1 lossy compression, should not be used for analysis, such as landscape classification analysis, where pixel-for-pixel fidelity is required. For more information on the original Oregon 2005 half-meter uncompressed imagery please contact the Oregon Geospatial Enterprise Office.

Chapter 1: Introduction to Web Map Services (WMS)

The Open Geospatial Consortium, Inc (OGC) (http://www.opengeospatial.org/) has developed a standard specification for requesting map images from a server over the internet known as a Web Map Service (WMS).

The OGC standards document (http://www.opengeospatial.org/standards/wms) defines a Web Map Service version 1.1.1 as:

> *"A Web Map Service produces maps of georeferenced data. We define a "map" as a visual representation of geodata; a map is not the data itself."*

A WMS gives you access to a map image in one of a number of standard image formats, including .jpg, .png, gif, and .tiff. A WMS gives you access to a map image without storing a local copy of the map image. This works well for viewing imagery and other raster data without having to download large amounts of data.

To access web map services over the internet you may use a standard web browser. For example, copy the link below and paste it into your browser to retrieve a part of the Oregon 2005 half-meter orthoimagery:

http://wms.oregonexplorer.info/ImageX/ecw_wms.dll?REQUEST=GetMap&SERVICE=WMS&VERSION=1.1.1&LAYERS=2005ORTHOIMAGERY.ECW&STYLES=&FORMAT=image/jpeg&BGCOLOR=0xFFFFFF&TRANSPARENT=TRUE&SRS=EPSG:4326&BBOX=-123.264589781291,44.5528060943808,-123.246887984351,44.5677519229348&WIDTH=835&HEIGHT=705

ArcGIS allows you to access these services and add them to your maps as layers. Other internet-aware applications allow you to access these services as well.

Chapter 2: Introduction Oregon Imagery Explorer WMS support

The Oregon Imagery Explorer (http://oregonexplorer.info/imagery/) serves Oregon's 2005 half-meter orthoimagery reconstructed from aerial photographs acquired in the summer of 2005. This imagery is available through an Open Geospatial Consortium version 1.1.1 compliant web map service (WMS) and implements the standard GetCapabilities and GetMap operations.

The WMS allows you to stream the entire state-wide imagery in the Oregon Imagery Explorer into your GIS or web application without downloading terabytes of data. The Oregon Imagery Explorer WMS produces images in ECW and JPEG 2000 formats, both which implement built-in pyramiding and indexing for efficient generation of image views at any scale.

The Oregon Imagery Explorer WMS supports the following projections:

EPSG Code	Name
4326	WGS 84
2992	NAD83/Oregon Lambert (ft)
2994	NAD83(HARN)/Oregon Lambert (ft)
32026	NAD27/Oregon North – Oregon State Plane
32027	NAD27/Oregon South – Oregon State Plane
2269	NAD83/Oregon North (ft) – Oregon State Plane
2270	NAD83/Oregon South (ft) – Oregon State Plane
2913	NAD83(HARN)/Oregon North (ft) – Oregon State Plane
2914	NAD83(HARN)/Oregon South (ft) – Oregon State Plane
26710	NAD27/UTM zone 10N
26711	NAD27/UTM zone 11N
26910	NAD83/UTM zone 10N
26911	NAD83/UTM zone 11N

Common Questions and Answers

Are there any restrictions to the maps?

Maps from the Oregon Imagery Explorer are freely available to the public (unless otherwise noted) and may be distributed or copied. We request that the following statement be used when citing, copying, or reprinting the maps: *"Maps available from the Oregon Imagery Explorer."*

What is the URL for the WMS service?

The following URL can be used to specify the WMS service within an application that supports WMS (i.e. ArcGIS 9.x):
http://wms.oregonexplorer.info/ImageX/ecw_wms.dll?

NOTE: This link will not by itself display imagery. You must be in an application that supports WMS requests.

What is the URL for the WMS capabilities?

The WMS capabilities file gives you information about a WMS service. For example the capabilities file can tell you about supported spatial reference systems, supported image formats and a list of layers.

The URL is:
http://wms.oregonexplorer.info/ImageX/ecw_wms.dll?service=wms&version=1.1.1&REQUEST=GetCapabilities

How can I view the WMS?

There are a lot of ways you can view the imagery. You can view in it in a Word document, in Adobe Photoshop, ArcGIS, and Internet Browsers.

What is the image server capable of?

To learn more about what the image server is capable of, please see the Image Web Server User Guide: http://imagery.oregonexplorer.info/IWSDoc/index.htm

Example applications

Applications that allow you to access web map services over the internet include, Minnesota MapServer, ArcGIS Desktop, ArcIMS, ArcServer, Moxi Media, and AutoCad.

Tutorial

Accessing imagery using GIS software

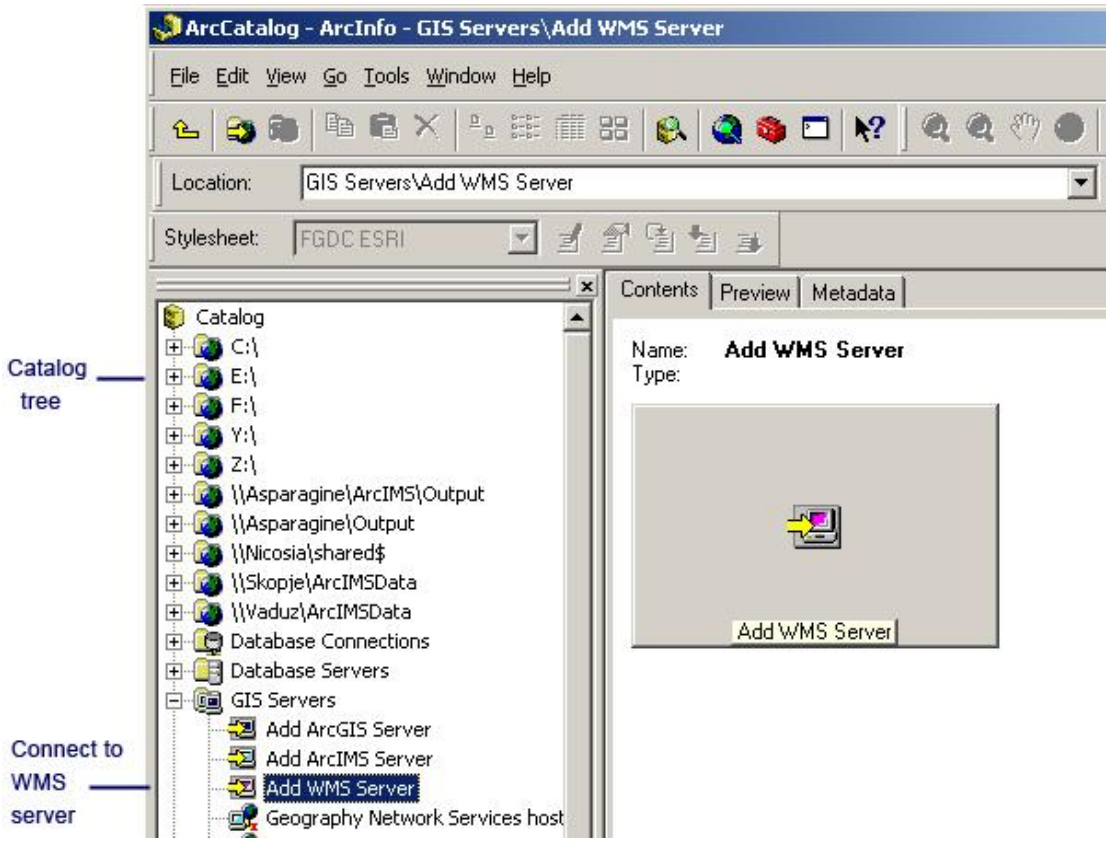
OGC WMS services work like ArcIMS image services for the most part. However there are some differences. This section of the tutorial will show you how to work with WMS services in ArcGIS. There are a number of issues related to working with WMS layers in ArcMap. See
http://support.esri.com/index.cfm?fa=knowledgebase.techArticles.articleShow&d=27825
for more information.

To access the web map service, you will need ArcGIS Desktop on your computer.

Adding a WMS service into a map in ArcGIS 9.x

Set up a connection to the Oregon Imagery Explorer Web Map Server
To access services provided by the Oregon Imagery Explorer Web Map Service (WMS) server, you will need to make a connection to the server. You may make the connection through ArcCatalog or through ArcMap.

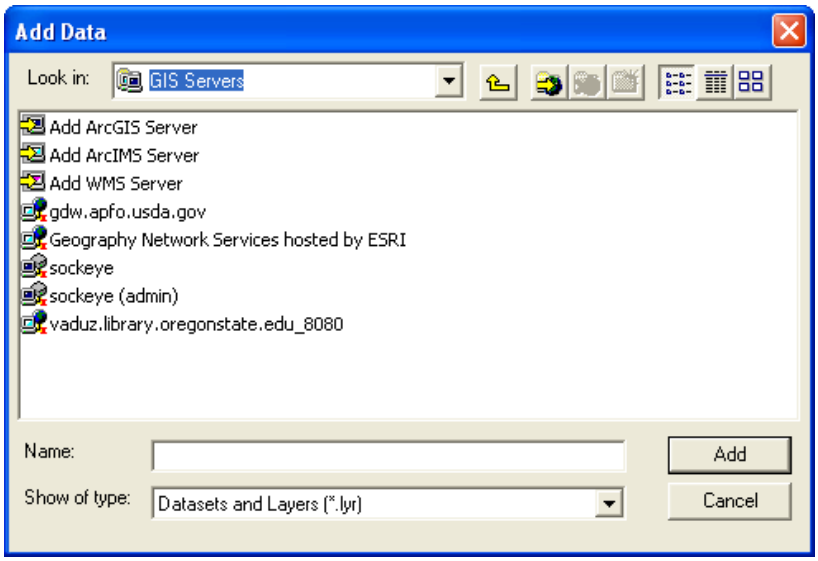
1. Connecting through ArcCatalog



a. Launch ArcCatalog and you will see a list of folders in the left-hand panel (called the Catalog tree).
b. In the Catalog tree, expand the GIS Servers folder if needed by double-clicking on GIS Servers.
c. Double-click on Add WMS Server
d. In the URL: box, type: http://wms.oregonexplorer.info/ImageX/ecw_wms.dll?
e. Click “Get Layers”. You will see a list of images in the WMS and the supported projections.
f. Click on OK button

Adding an ArcIMS Web Service to ArcMap in ArcGIS 9.x

1. Launch ArcMap
2. Click on the ‘Add Data’ button 
3. When the pop-up window appears, navigate to ‘GIS Servers’ and double click ‘Add WMS Server’.



4. In the Add WMS Server window, type in the url for the WMS imagery server: http://wms.oregonexplorer.info/ImageX/ecw_wms.dll?

Adding an ArcIMS Web Service to an IMF application

Use the <wms-layer> element to add layers from our WMS servers to your IMF application with ArcIMS layers.

Sample Code:

```
<wms-layer name="Oregon 2005 half-meter orthoimagery"
position="bottom" href="http://159.121.106.157/ImageX/ecw_wms.dll?" version="1.1.1"
format="image/jpeg" srs="EPSG:2992" layers="2005_orthoimagery" visible="true">
    <property name="osuLayerInfoUrl" value="layerinfo/doq.txt"/>
</wms-layer>
```

ECWP vs. WMS

Imagery in the Oregon Imagery Explorer also supports the ECWP protocol. ER Mapper/Leica Geosystems has developed the ECWP protocol and describles it as "the fastest way of accessing large imagery datasets. The ECWP protocol transfers compressed blocks from the server to the client, providing realtime roam and zoom functionality on image updates. Many applications natively support ER Mapper's streaming imagery protocol."
"ER Mapper/Leica Geosystems supplies free plug-ins for Internet Explorer and Netscape browsers as well as many major imaging packages to enable streaming ECWP access."

For downloads to plugins for popular applications: See http://www.ermapper.com/ProductView.aspx?t=189

The following URL will access imagery from the Oregon Imagery Explorer in ECWP protocol for applications that support ECWP:

ecwp://imagery.oregonexplorer.info/ecwimages/2005orthoimagery.ecw

Steps to add imagery in ArcGIS 9.x through ECWP rather than WMS

1. Download the "ArcGIS® 8.x and 9.x ECW JPEG 2000 plugin" from ER Mapper website: http://www.ermapper.com/Downloads.aspx?v=327
2. In ArcMap -> View -> Toolbars -> ECW and ER Mapper. This will add the ECW and ER Mapper Toolbar to ArcMap.
3. Click on the  button. In the Add image into ArcGIS dialogue box, type: ecwp://imagery.oregonexplorer.info/ecwimages/2005orthoimagery.ecw
4. Click OK. This will add the 2005 Half Meter Orthoimagery as a layer to your ArcMap session as a 3 band image.

Abbreviated Terms

CGI	Common Gateway Interface
DOQ	Digital Orthophoto Quadrangle
ECW	ER Mapper Enhanced Wavelet
GIF	Graphics Interchange Format
GIS	Geographic Information System
HTTP	Hypertext Transfer Protocol
JPEG	Joint Photographic Experts Group
NAD	North American Datum
OGC	Open GIS Consortium
PNG	Portable Network Graphics
URL	Uniform Resource Locator
WMS	Web Map Service
XML	Extensible Markup Language

Bibliography

Earth Resource Mapping Pty Ltd. Using and distributing ECW V2.0 wavelet compressed imagery. Technical white paper. 2001. [Accessed June 19, 2007] <http://www.earthetc.com/iws/Downloads/tech_papers/ecwv20wp.pdf>

United States Department of Agriculture (USDA): Aerial Photography Field Office. Compression Information Sheet. 2006. [Accessed June 12, 2007] <http://www.fsa.usda.gov/Internet/FSA_File/compression_2006_update.doc