



Forest Service
U.S. DEPARTMENT OF AGRICULTURE

ArcGIS Online Arcade

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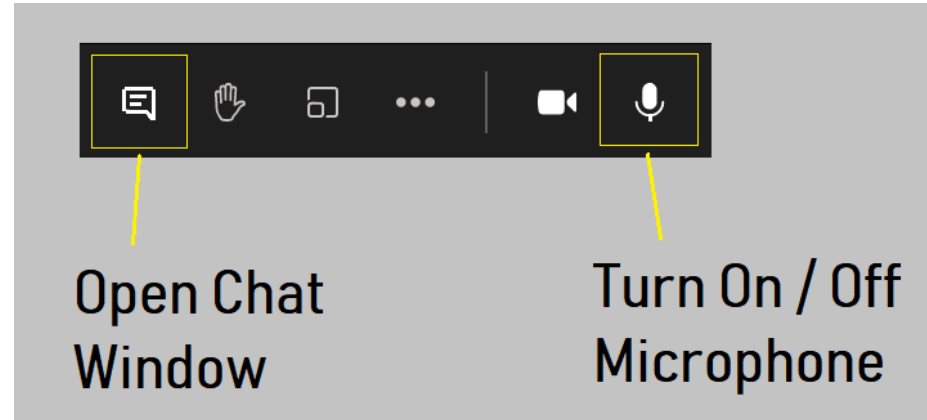


Geospatial Technology
and Applications Center

Housekeeping

Teams

- Quick orientation on interface
- How to turn on Captioning
- Question or comment?
 - Un-mute
 - “Raise” your hand
 - Send a chat



Course Format & Learning Styles

- Many different learning styles: visual, auditory, kinesthetic, etc.
- Webinar format seeks to address a variety of learning styles
 - PPTs, live demonstrations, step-by-step exercises
 - Content may be repetitive for some people
 - Feel free skip formats that don't serve your learning style




Course Overview

- Lesson

- Demo

- Optional Exercises



≈ 1 hour



Overview

- Comparison of Image Services and the Raster Data Warehouse (RDW)
- Image Services specifics
- RDW specifics
- Demonstration: how to access, use, and add data to the servers

IS and RDW Similarities

- Both use ArcGIS for Server 10.X to serve data (image services or map services)
- REST endpoints available to developers
- You can request data be added to both servers
- Image processing functionality
 - Raster function templates
 - Pixel based processing functionality
 - Analysis for discrete (categorical) and continuous raster datasets.

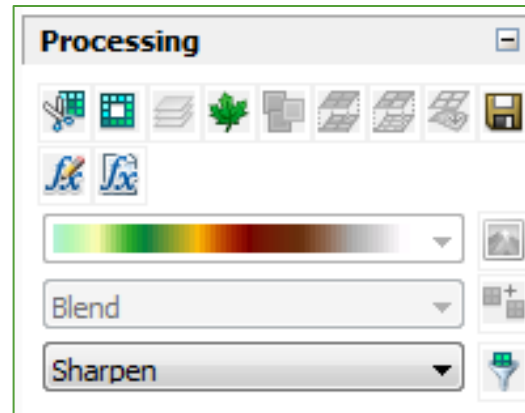


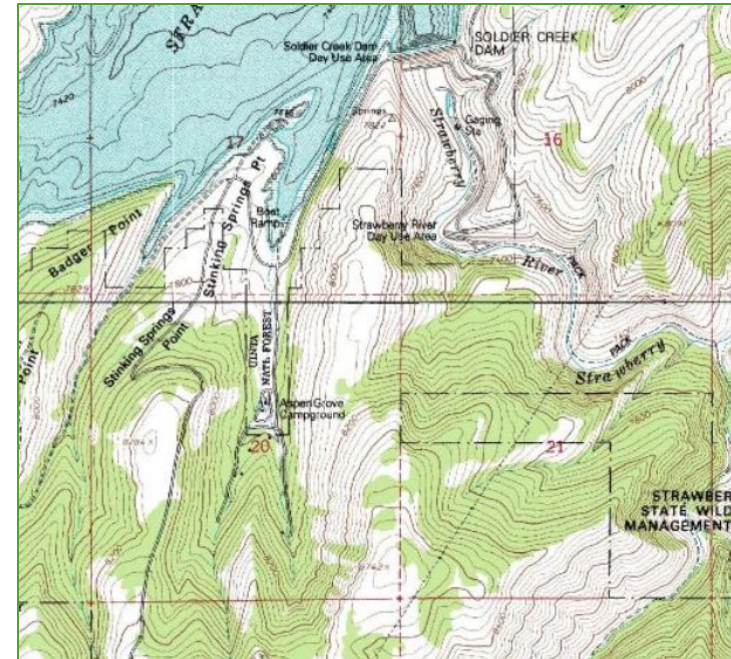


Image Services and RDW Differences

- Image Services accepts wide range of products; RDW only authoritative rasters
- Image Services takes lidar derived raster products; not yet at RDW
- RDW faces both external and internal; Image Services only faces internal
- Adding data to RDW is more complicated than for Image Services

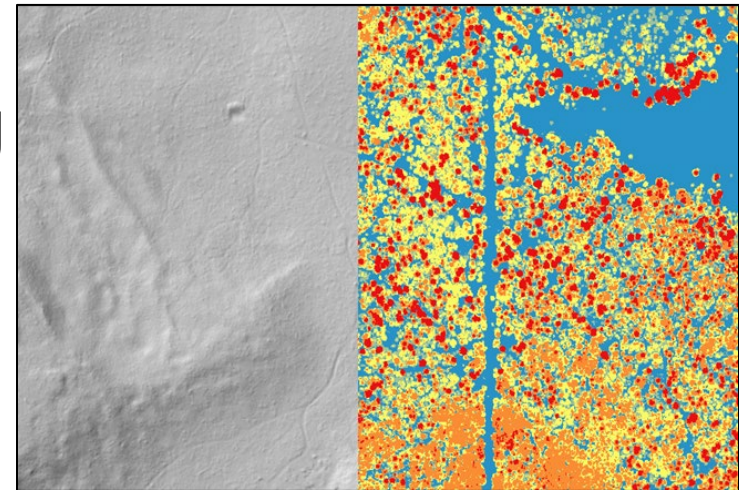
FS Image Services

- Largely used for viewing and backdrop analysis
- Accepts all imagery products (airborne, satellite, scanned georeferenced, etc.)
- Includes eTopo and FSTopo
- Submittal requests
- Internal facing only



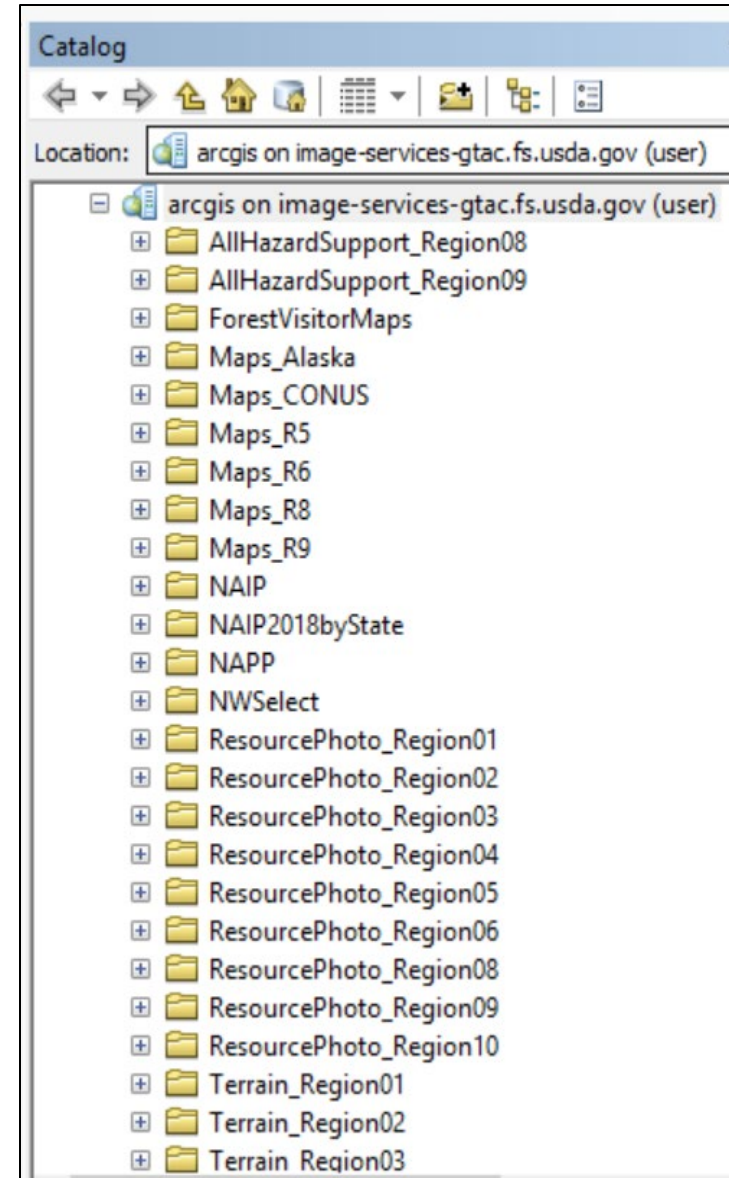
FS Image Services

- Image Services are a GIS Service
 - Current high-resolution datasets
 - Quick, easy access without storing your own data
 - Widely available to Forest Service
 - Preprocessed data
 - NOT for advanced processing
 - NOT for spectral analysis



FS Image Services – Folder Setup

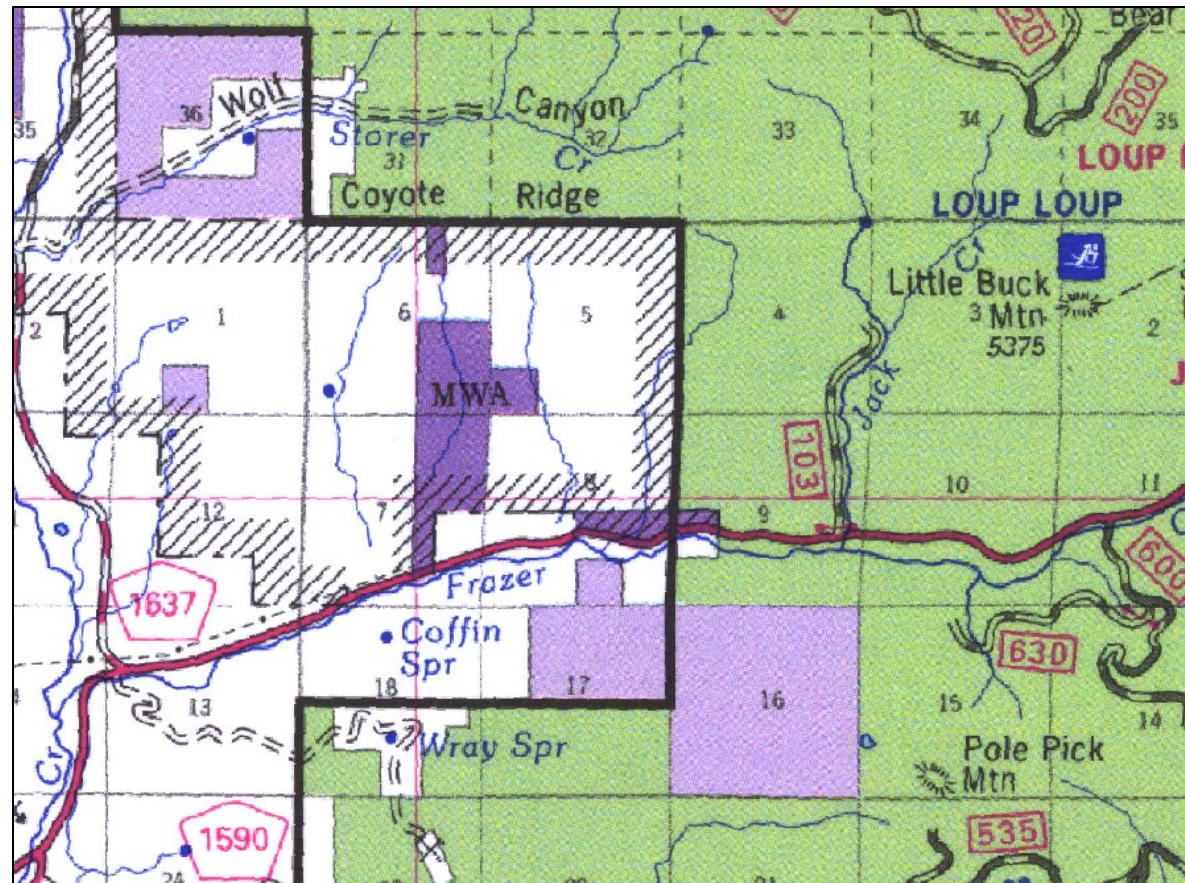
- Forest Visitor Maps
- Maps
- NAIP
- NAPP
- NWSelect
- Resource Photography
- Terrain



Forest Visitor Maps

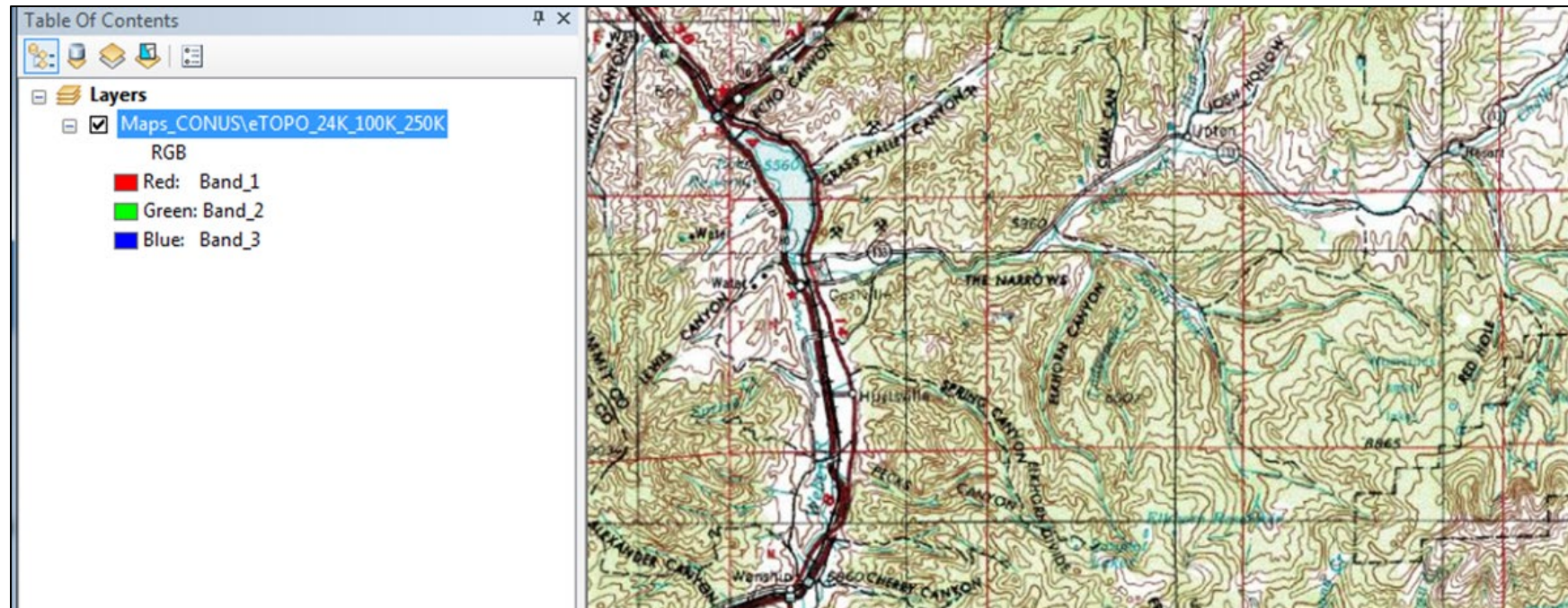
Check if your region's visitor map is up to date.

- Work with your Regional GIS Coordinator to update



Maps CONUS - eTOPO

- USGS DRGs (digital raster graphics)
- Green tint = forest
- 1:24,000; 1:100,000; 1:250,000



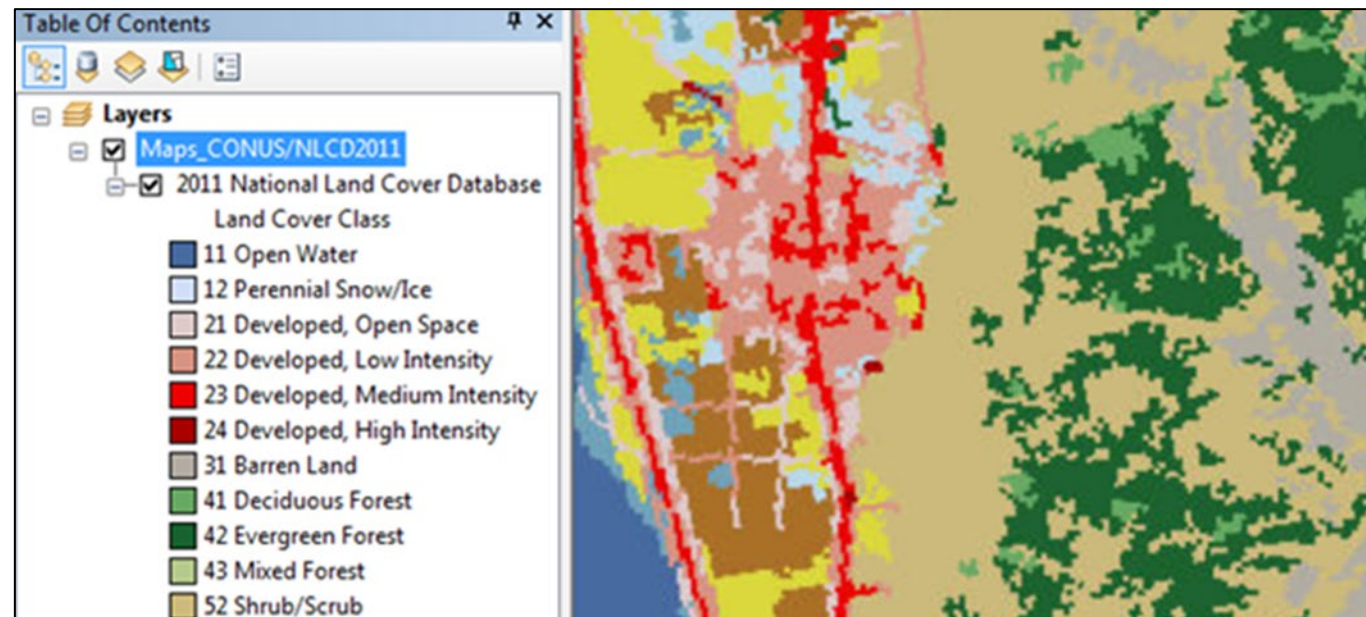
Maps CONUS - PBS_GeoTiff

- Softcopy PBS (Primary Base Series)
- A.k.a- FSTopo
 - Similar to USGS DRGs, but made by Forest Service
 - Higher resolution than DRGs
 - No green tint
 - Only for quads with Forest Service lands



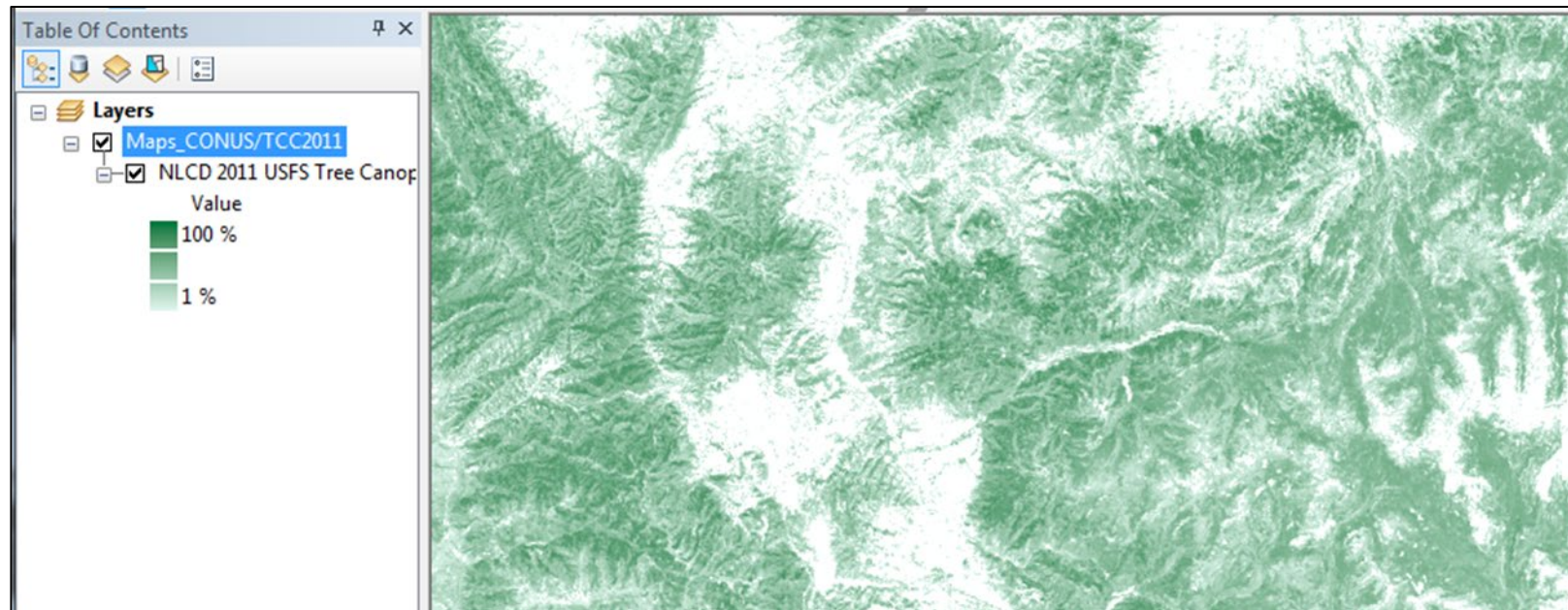
Maps CONUS - NLCD

- NLCD (National Land Cover Database)
 - 16 class land cover classification scheme
 - 30 m resolution
 - Assess land cover changes from 2001 to 2011 to 2016



Maps CONUS - TCC

- TCC (Tree Canopy Cover)
 - NLCD tree canopy cover dataset for CONUS
 - 30 m resolution
 - Single layer, percent tree canopy cover



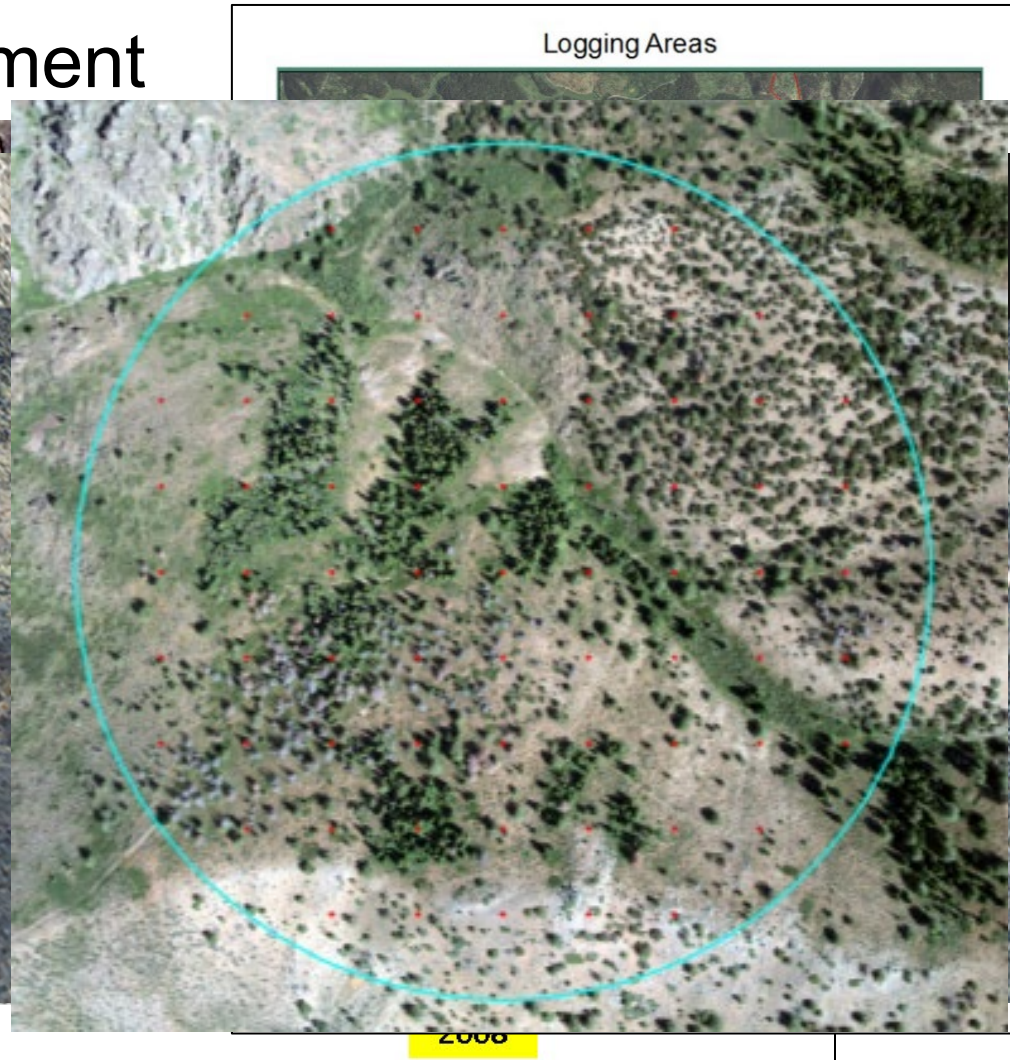
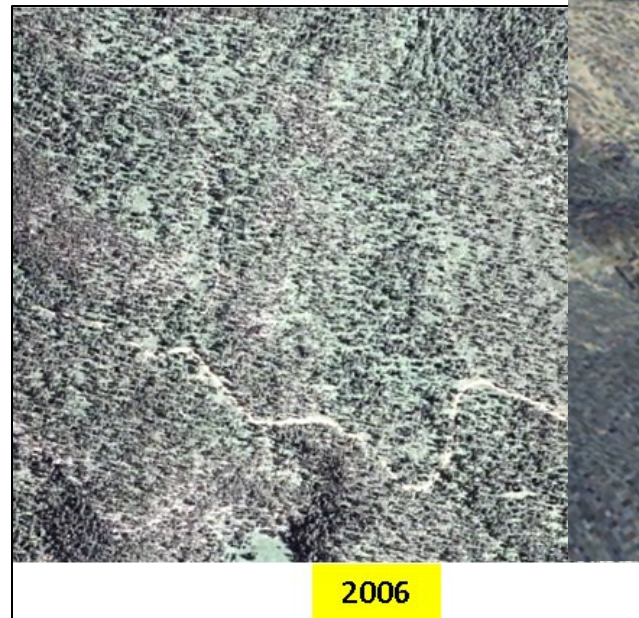
NAIP

- National Agricultural Imagery Program
- High resolution
- **Free!**
- Has infrared band
- Easily accessible and preprocessed!



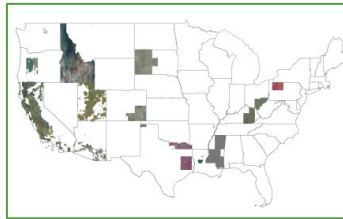
How can NAIP be useful to you?

- Monitoring change / updating GIS
- Forest health assessment
- Map backdrop
- Image drape (3D)
- Image sampling



NAIP Acquisitions

CONUS for each year of NAIP 2004- 2014



2004



2005



2007



2008



2009



2010



2011



2012



2013



2014

2015....

Other NAIP Sources

- Aerial Photography Field Office is one of the nation's largest aerial film libraries
 - [APFO website](#)
 - [Email: apfo.sales@slc.usda.gov](mailto:apfo.sales@slc.usda.gov)



The screenshot displays the USDA Farm Service Agency website. The header features the USDA logo and the text "United States Department of Agriculture Farm Service Agency" on the left, and a "Search FSA" search bar on the right. A navigation menu below the header includes "Home", "Programs and Services" (with a dropdown arrow), "State Offices", "Online Services" (with a dropdown arrow), and "Newsroom" (with a dropdown arrow). A "Site Map" link is located in the top right corner. The main content area is divided into two columns. The left column, titled "Related Topics", lists: Imagery Products, Imagery Programs, Status Maps, Contract Services, Meetings, Support Documents, and Geospatial Services. The right column shows a breadcrumb trail: "Home / Programs and Services / Aerial Photography" and a large heading "Aerial Photography".

Other NAIP Sources

- [GeoSpatial Data Gateway website](#)
 - Map library of high resolution vector and raster layers including **NAIP**
 - Search by county, state, place, or custom AOI
 - Download or shipped on media



The screenshot shows the website interface for the GeoSpatial Data Gateway. At the top, there is a navigation bar with the text "Agriculture Information Service" on the left and "GeoSpatialDataGateway" on the right. Below the navigation bar, there is a search bar and a navigation menu with links for "Home", "Status Maps", "Help", "FAQ", and "Contact Us". The main content area is divided into two columns. The left column is titled "WHAT" and contains a list of available map layers for a selected area of interest. The right column is titled "YOUR ORDER" and contains order details. The "WHAT" section lists two map layers: "Ortho Imagery" and "Ortho NAIP". The "Ortho NAIP" section lists two map layers: "2003 National Ag. Imagery Program Mosaic" and "2004 National Ag. Imagery Program Mosaic". The "YOUR ORDER" section shows the "Order Area (Where)" as "Salt Lake County, Utah" and the "Order Format (How)" and "Order Projection (How)" as "None".

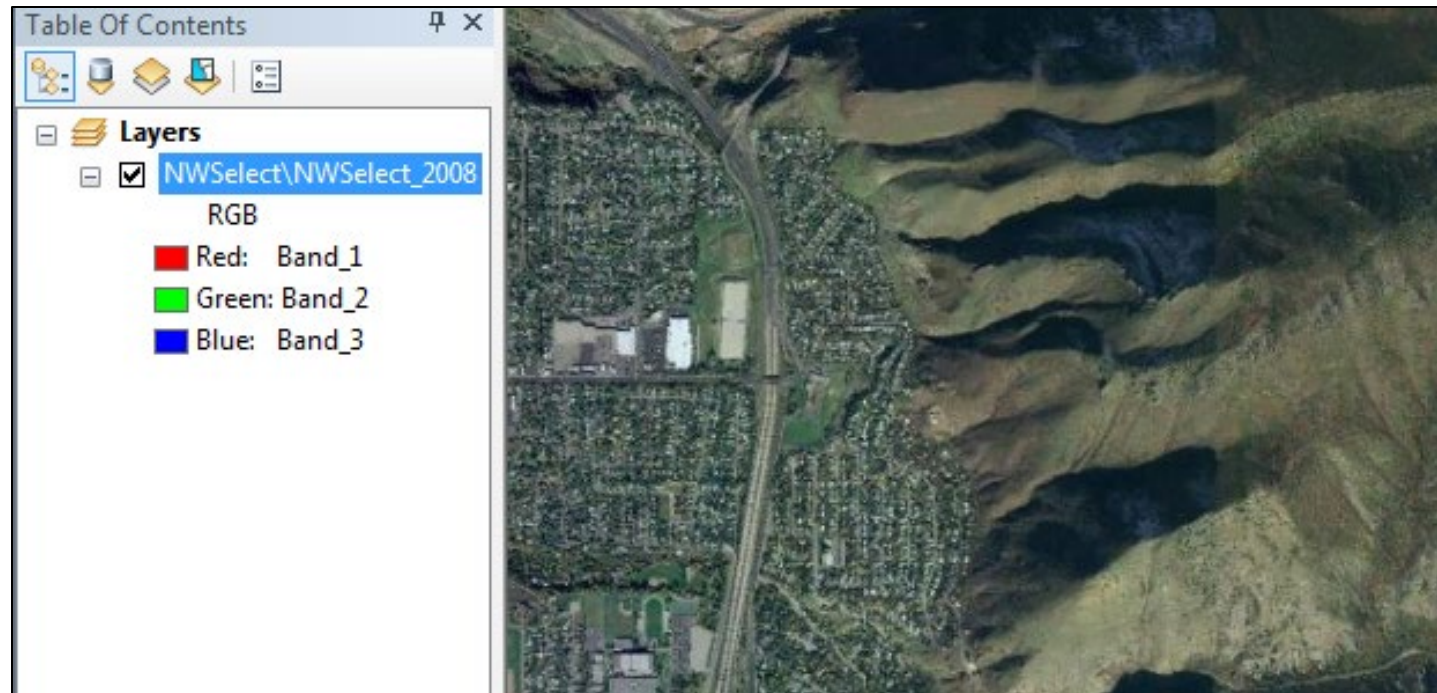
NAPP

- A little history...
 - NARA (National Archives and Records Administration) for pre 1955 imagery
 - Pre 1980: B&W images
 - NHAP (National High Altitude Photography)
 - NAPP (National Aerial Photography Program)



NWSelect

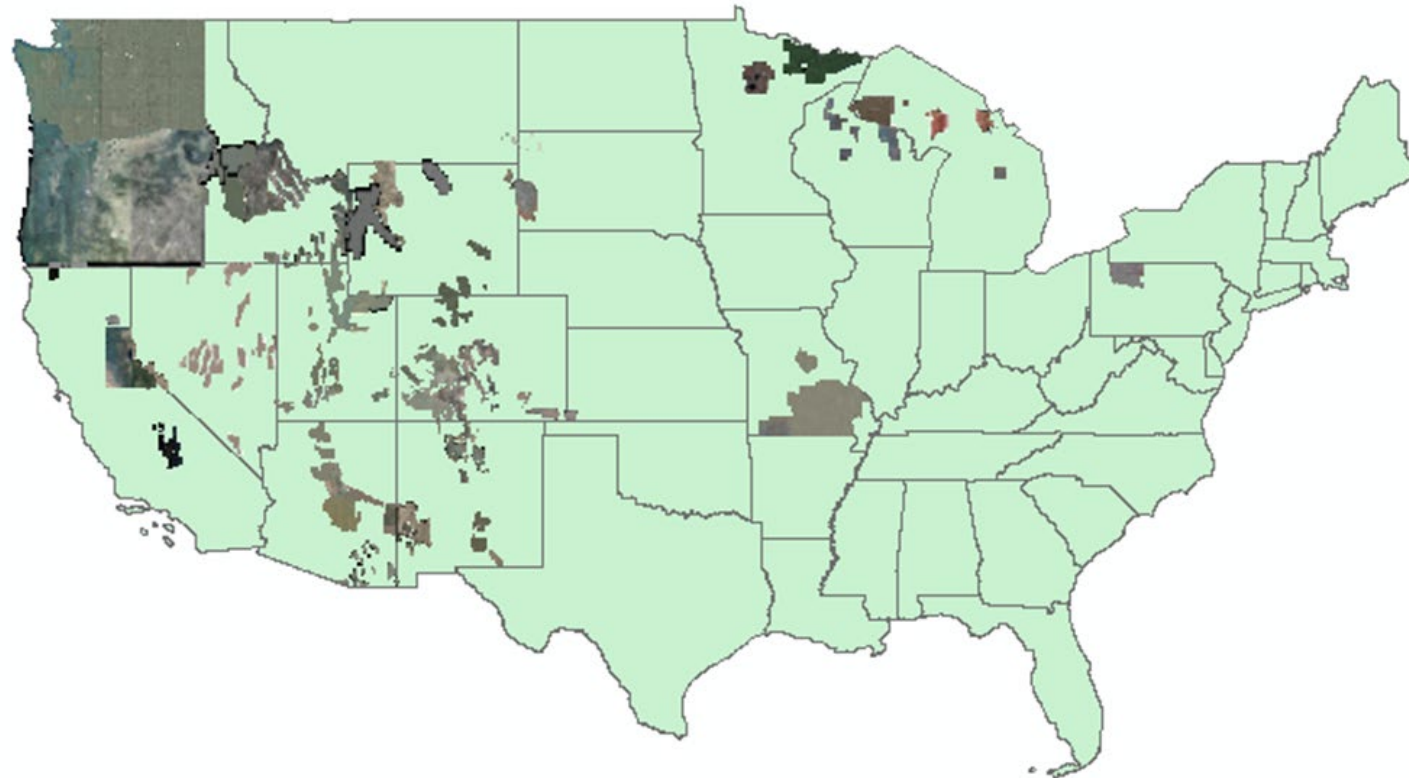
- Nationwide Select
- NAIP at largest scale
- Landsat and MODIS at smaller scales





Resource Photography

Resource and high resolution satellite -
individual services by project



Terrain

- Lidar Derivatives:
 - Bare earth
 - Highest hit hillshade
 - Bare earth hillshade
 - Canopy height
 - Others.....

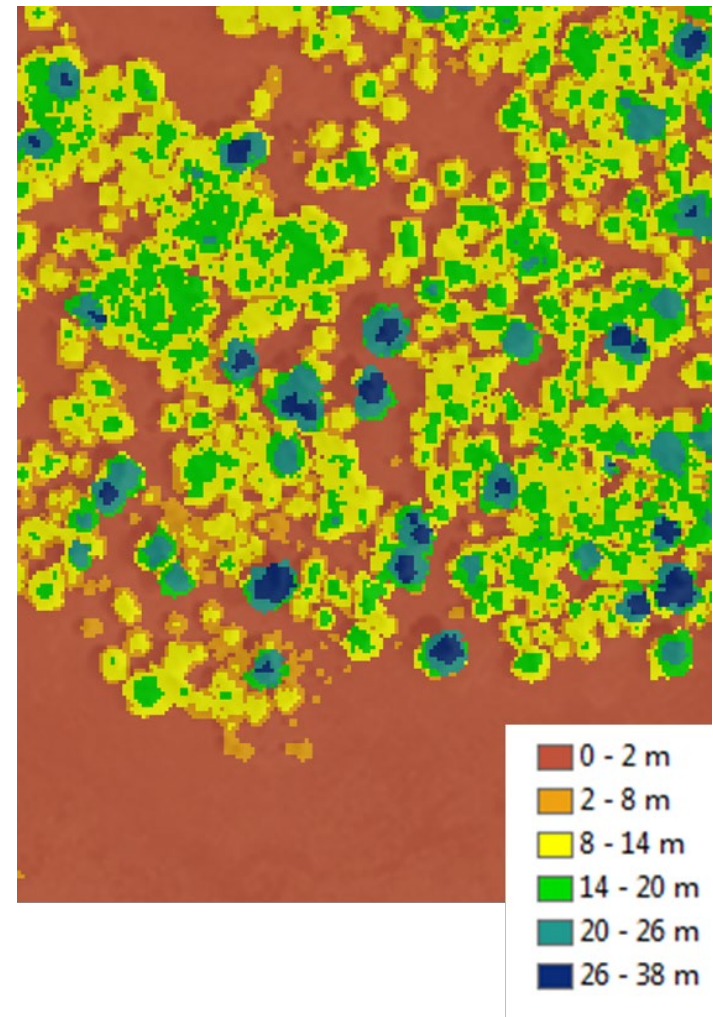
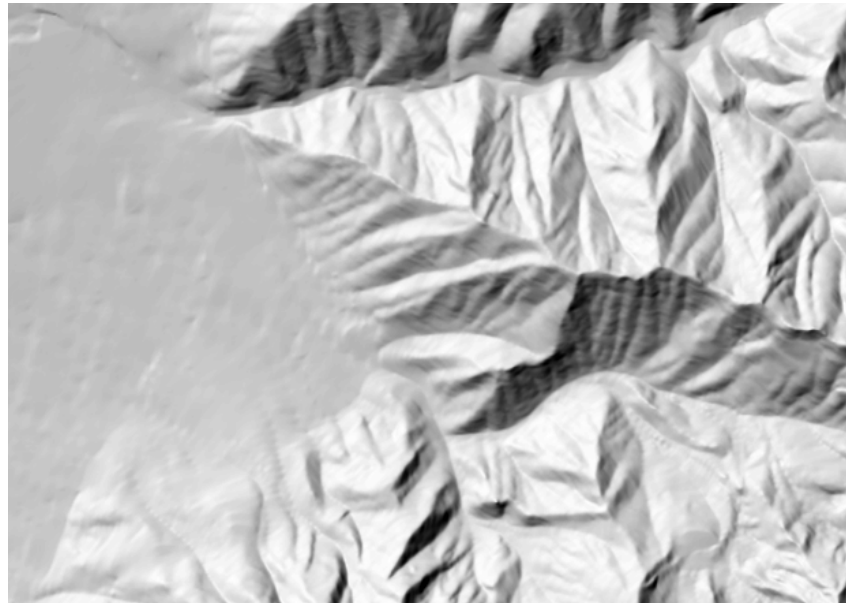


Image Services Overview Page


- [Image Services website](#)
 - Important information regarding updates
 - Links to articles about using the services

Image Services

GTAC image services provide a way for users across the Forest Service to access a large variety of imagery and map data for their projects. Web-based image services serve the following business requirements:

- Provide current and historical high-resolution datasets,
- Ensure quick and easy access to data,
- Make high resolution data widely available to Forest Service resource and geospatial specialists, and
- Serve preprocessed data for analysis.

Image interpretation, basic image processing, updating GIS information (heads-up digitizing), map backdrops, 3D image overlay, field navigation, and reconnaissance are just a few of the ideal uses for imagery, maps, and derived data layers offered through image services.

 **Using Image Services** The Image Services Guides button below will



Getting Your Data Hosted on Image Services

- Before submitting a request, consider the following:
 - Make sure the service isn't already published
 - Not all file formats, bit depths, or imagery types will be accepted
 - Single mosaic or tiled
 - Should already be fully processed
 - Color balanced
 - Orthorectified
 - Other processing
- Submit request to: SM.FS.GTAC@usda.gov

Image Services vs. Map Services

Image Services	Map Services
Preferred if data to be used for analysis by end user.	Must be used if a legend is needed.
Users have choice of viewing cached or dynamic.	Will be either cached or dynamic, cannot publish both.
Can only use continuous data; categorical data and legends are not possible.	Must be dynamic if multiple layers are included.
Service can be used directly in some tools in the ArcToolbox	

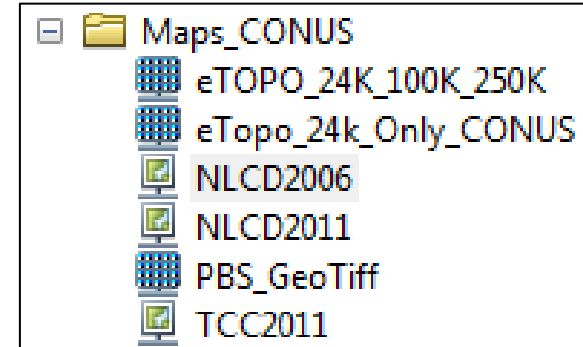
Folder: RDW_Wildfire

Current Version: 10.31

View Footprints In: [ArcGIS Online map viewer](#)

Services:

- [RDW_Wildfire/MTBS_Alaska](#) (MapServer)
- [RDW_Wildfire/MTBS_CONUS](#) (MapServer)
- [RDW_Wildfire/MTBS_Hawaii](#) (MapServer)
- [RDW_Wildfire/MTBS_PuertoRico](#) (MapServer)
- [RDW_Wildfire/RMRS_WildfireHazardPotential_2014](#) (ImageServer)
- [RDW_Wildfire/RMRS_WildfireHazardPotential_2014](#) (MapServer)



= Image Service



= Map Service



What are Caches?

- Similar to image pyramids for improving speed of image display
 - a.k.a **Static** map service
 - Preprocessed tiles stored on your hard drive
 - Meant for zooming and panning
 - NOT for processing or detailed analysis (must switch to Dynamic mode to access raw data)



Raster Data Warehouse Overview

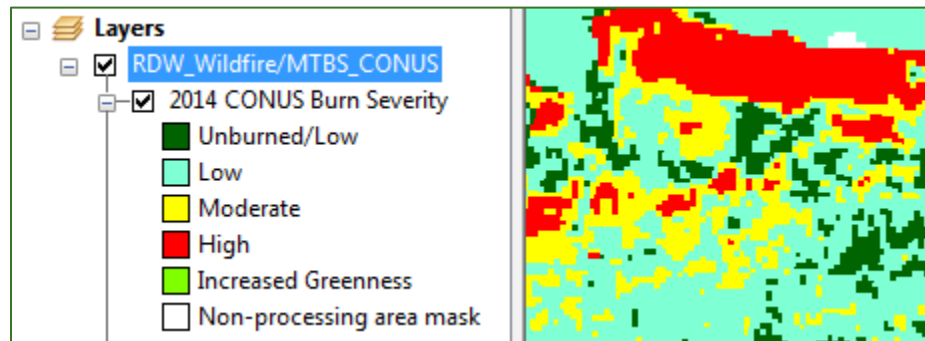
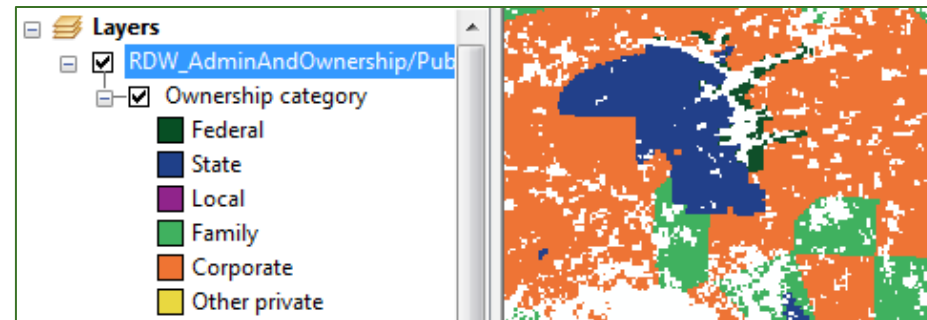
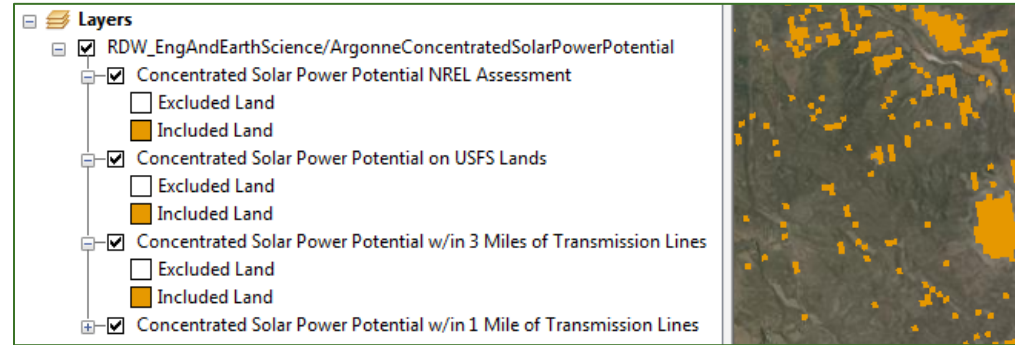
- Part of the Enterprise Data Warehouse at the FS Kansas City Data Center
- Intended for authoritative FS produced products (not raw data or imagery)
- External (public) facing and internal (FS only) options
- All data submitted reviewed by Content Governance board (same as EDW)
- More information on [GTAC's website](#)

RDW – Folder Setup

- Folders contain continuous and thematic raster datasets

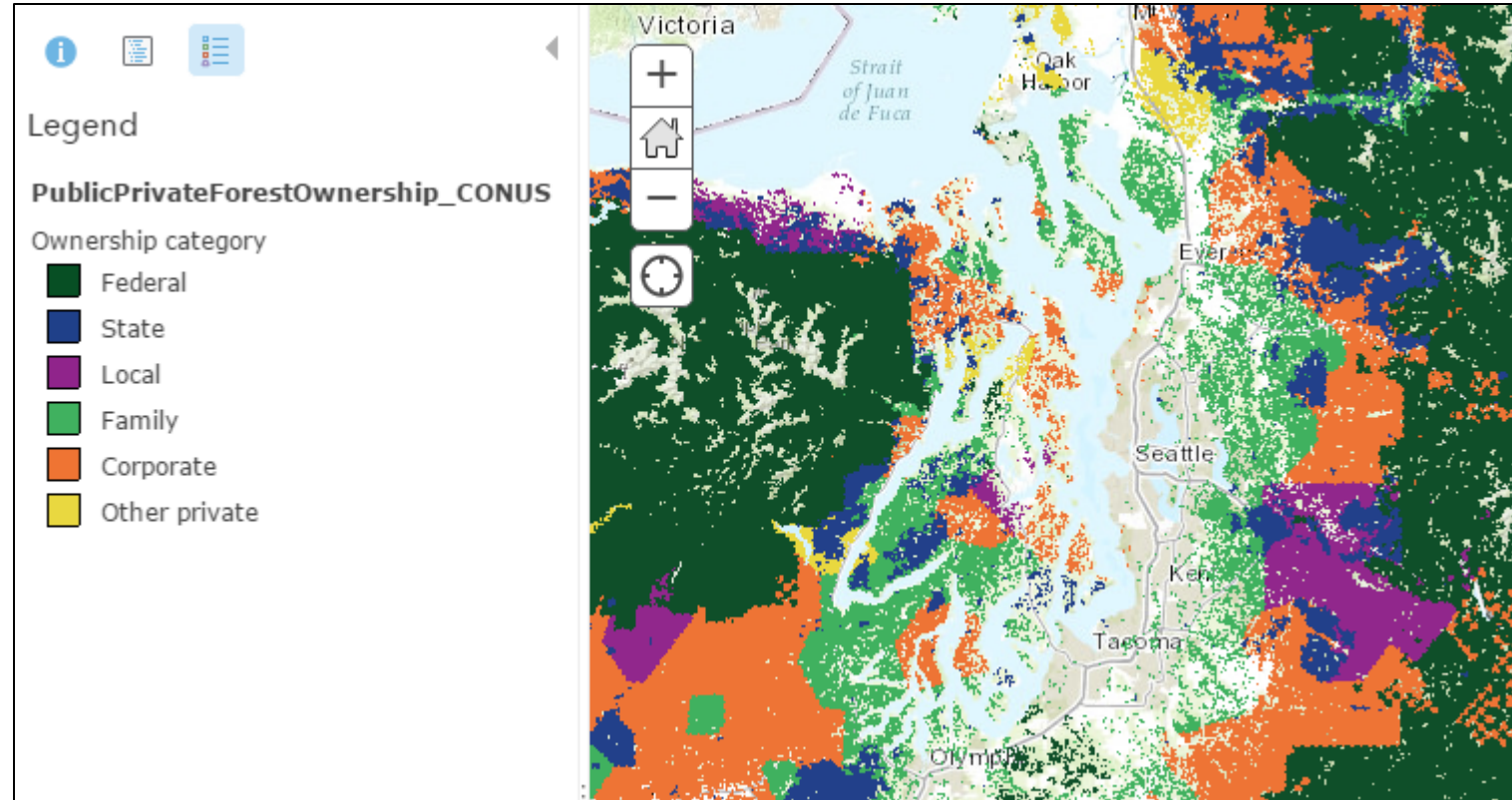
datasets

- Administration and Ownership
- Climate
- Engineering and Earth Science
- FIA Forest Atlas
- Inventory and Products
- Landscape and Wildlife
- Wildfire



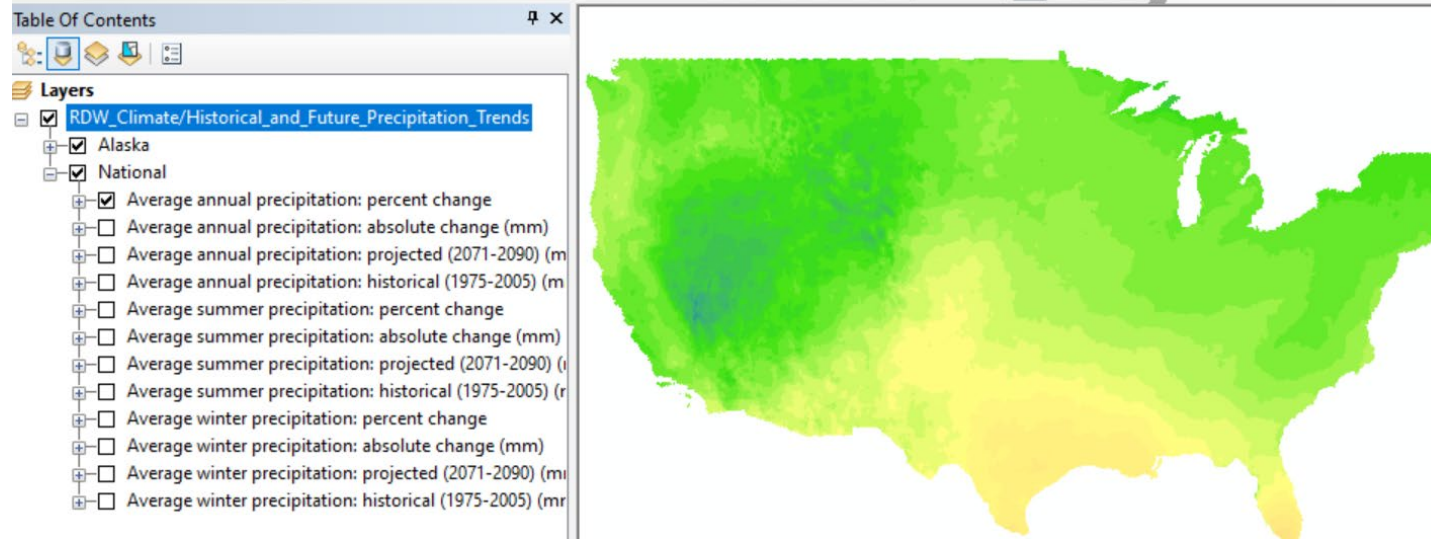
RDW_AdminAndOwnership

- Public/Private forest ownership data designed for national or regional scale analysis

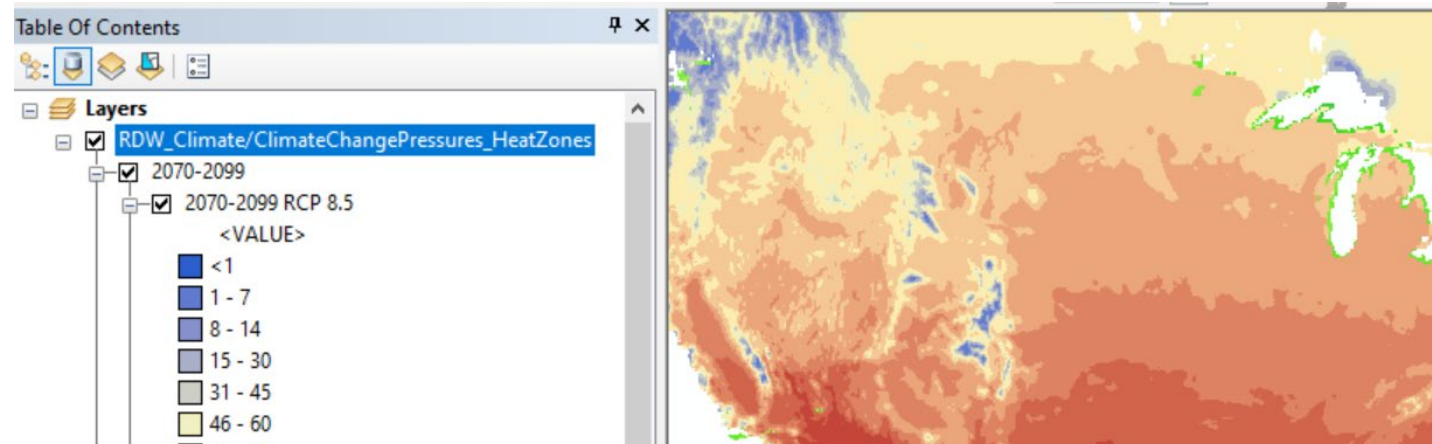


RDW_Climate

- Historical and Future Precipitation Trends

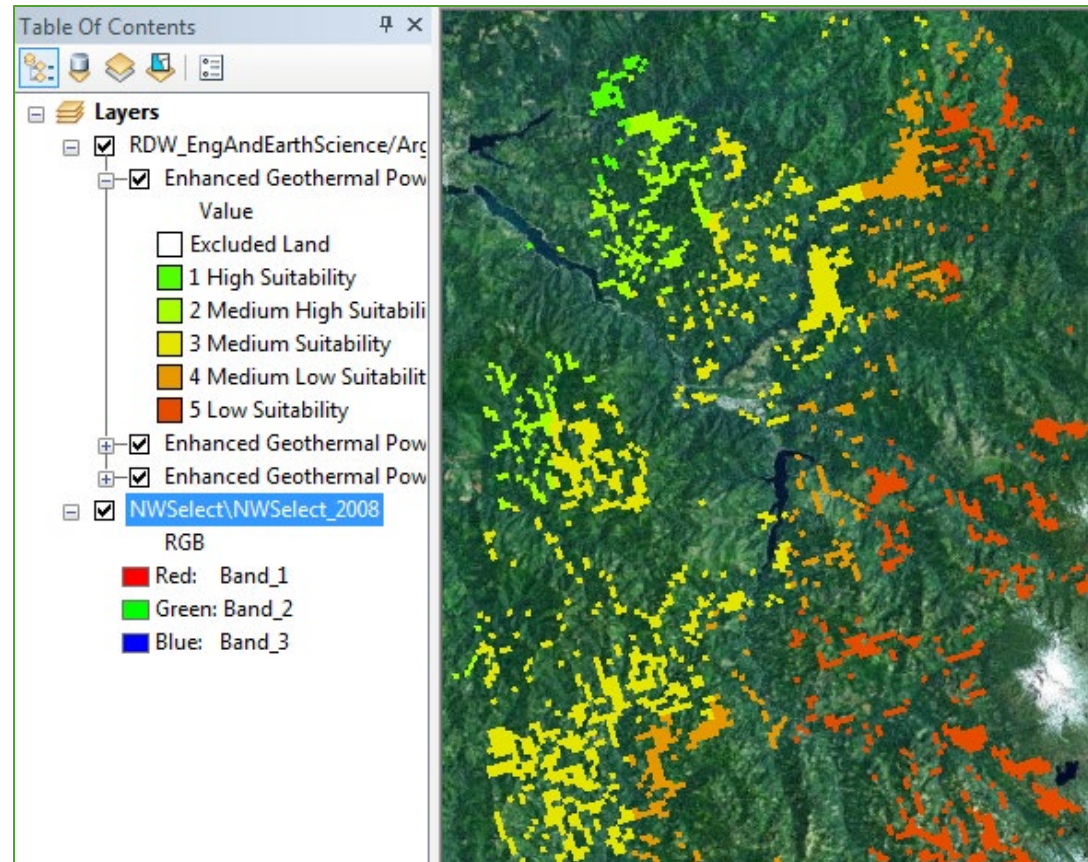


- Climate Change Pressures: Heat Zones



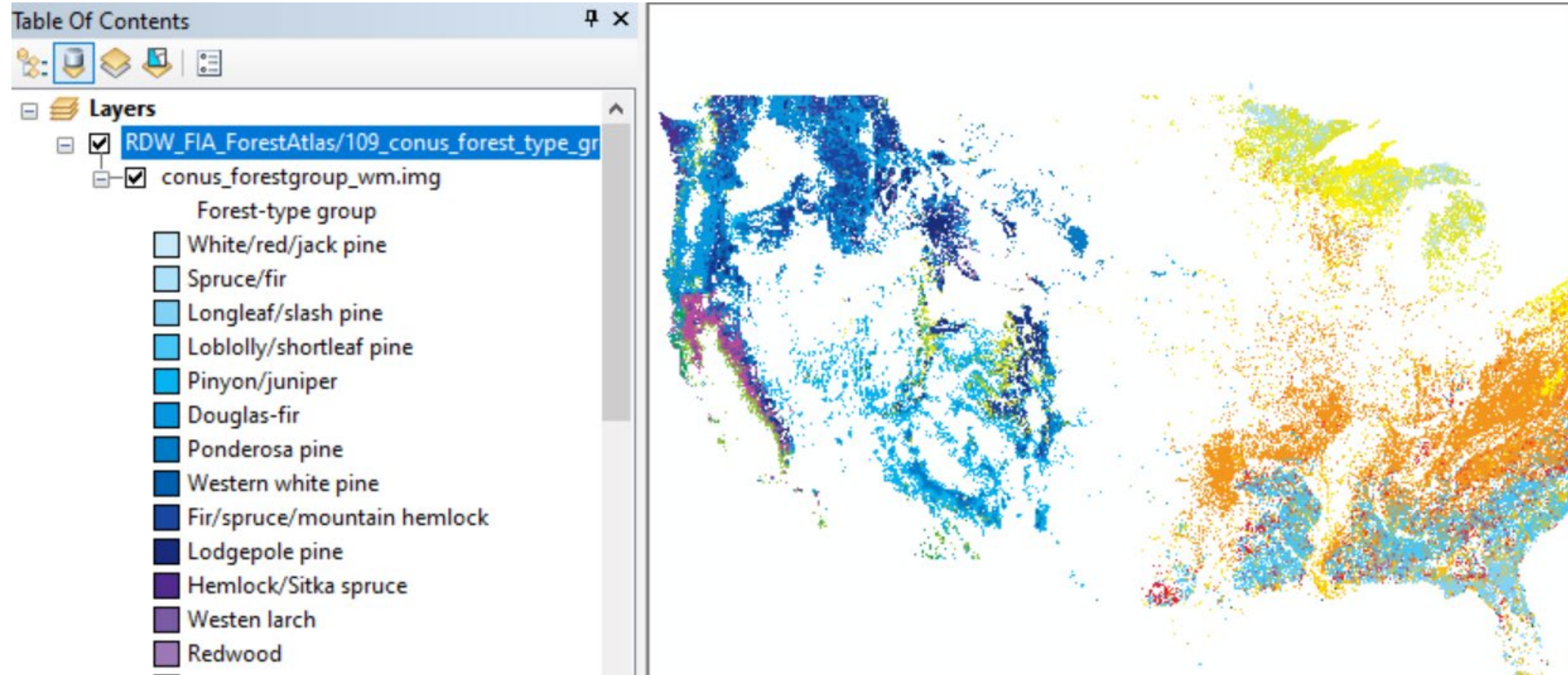
RDW_EngAndEarthScience

- Data from the Argonne National Laboratory
 - Power potential layers
 - Biomass
 - Geothermal
 - Solar
 - Photovoltaic
 - Wind



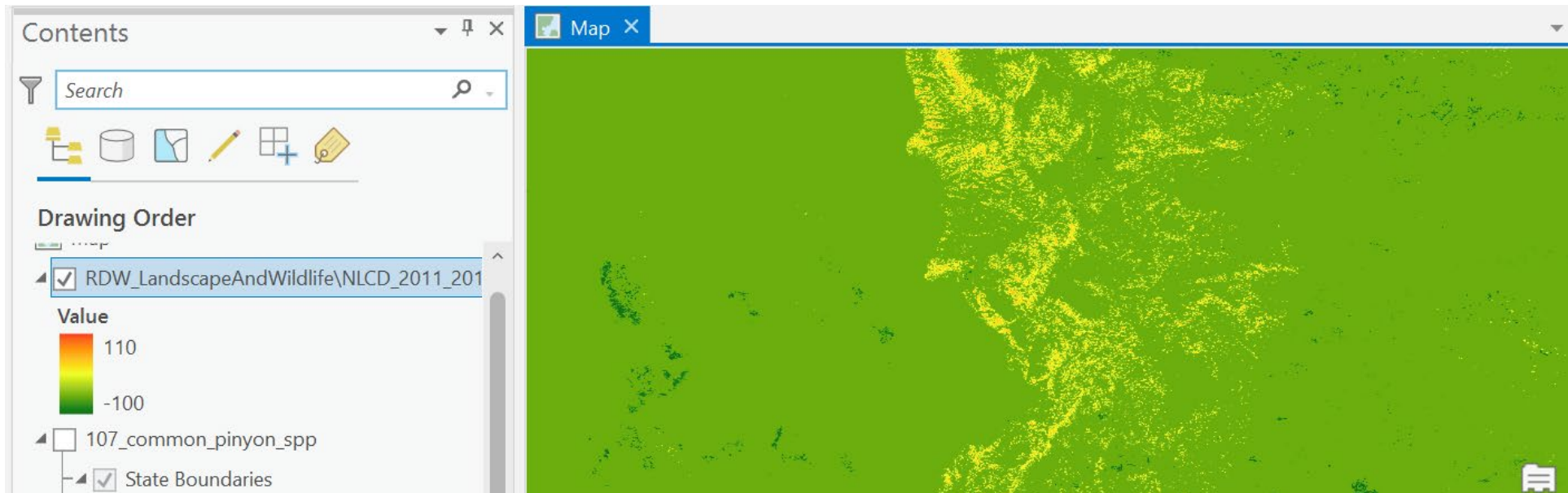
RDW_FIA_ForestAtlas

- CONUS Forest Type Group



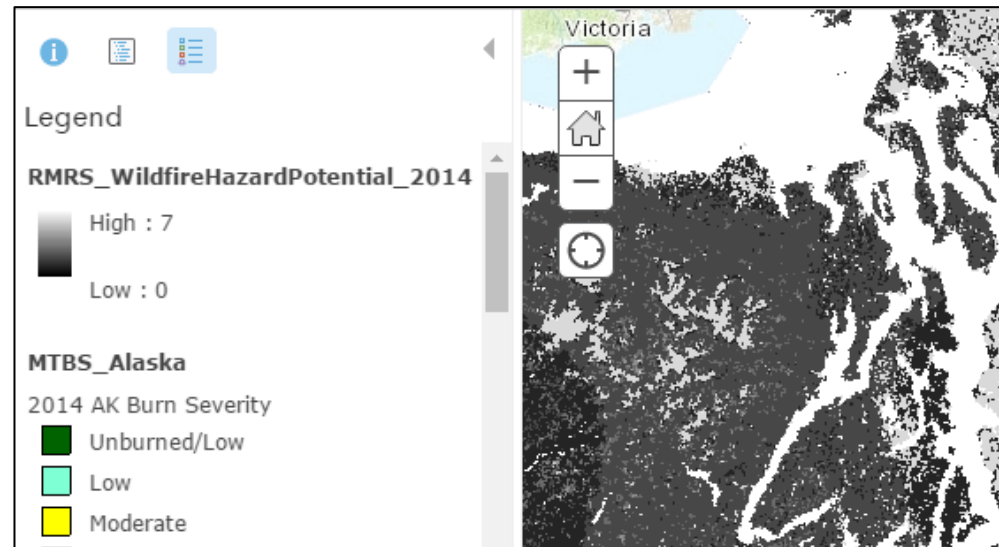
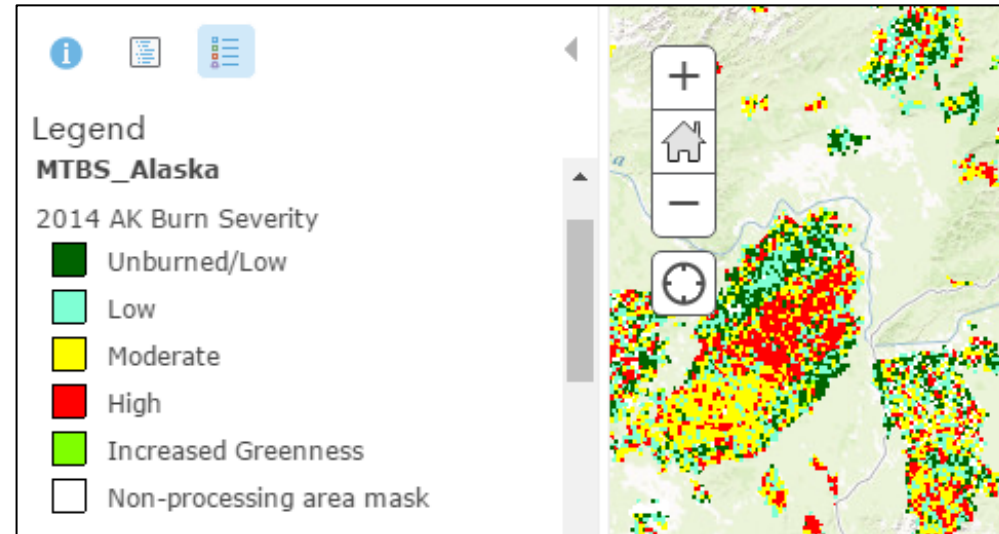
RDW_LandscapeAndWildlife

- 2011-2016 Tree Canopy Change CONUS



RDW_Wildfire

- Data from the Monitoring Trends in Burn Severity (MTBS) project
- Wildfire Hazard Potential
- Also BAER and RAVG layers



RDW SharePoint

- [RDW Sharepoint website](#)
 - Basic info about RDW
 - Links to all published RDW services

Enterprise Data Warehouse (EDW) About the EDW Tools, Training & Support Content Governance

RDW

Dataset Status

- Dataset Approval Status
- Data Status
- Dataset Candidates
- EDW SDE Data Source
- EDW gPAS
- Public Map Services
- Internal Map Services
- Open Data Esri
- FSGeodata
- Data IFVM Publication
- Web REST Services
- Strategy Implementation
- Unit Participation/Layer

Welcome to the Raster Data Warehouse Page

Forest Land Ownership

- Federal
- State

RDW—Administration and Ownership
Information related to the jurisdictions of FS lands

Internal Image Service REST links – No services currently available

[External Image Service REST links](#) – No services currently available

Internal Map Service REST links – No services currently available

[External Map Service REST links](#)

RDW—Climate
Historical temperature, rainfall, and similar information

[Internal Image Service REST links](#)

[External Image Service REST links](#)

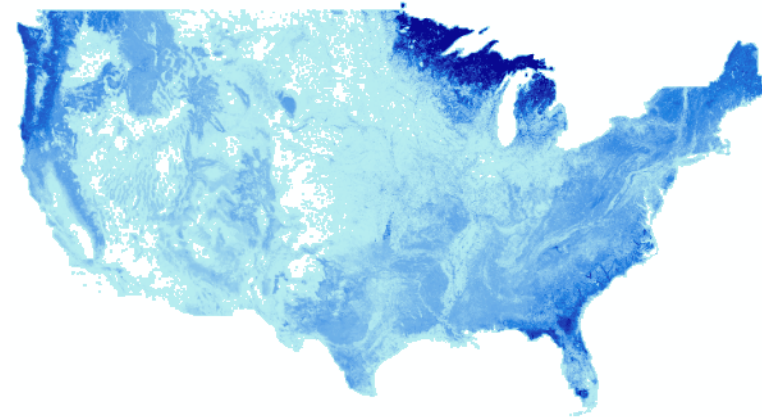
Internal Map Service REST links – No services currently available

[External Map Service REST links](#)

RDW—Engineering and Earth Science
Services about our soils, structures, and human imprint

Getting Your Data Hosted on the RDW

- Data qualifications for RDW:
 - Supports the Forest Service mission
 - Authoritative for the subject
 - Has a multi-regional or national scope
 - Well documented with metadata
 - Process to keep data current



RDW Data Hosting Process

1. [Download and Complete the Content Request Form](#)
2. Submit to SM.FS.data@usda.gov
3. Meet with Content Governance Board
4. Transfer Data to RDW
 - NAS
 - FTP
 - Portable Hard Drive
5. Follow-up call with RDW staff

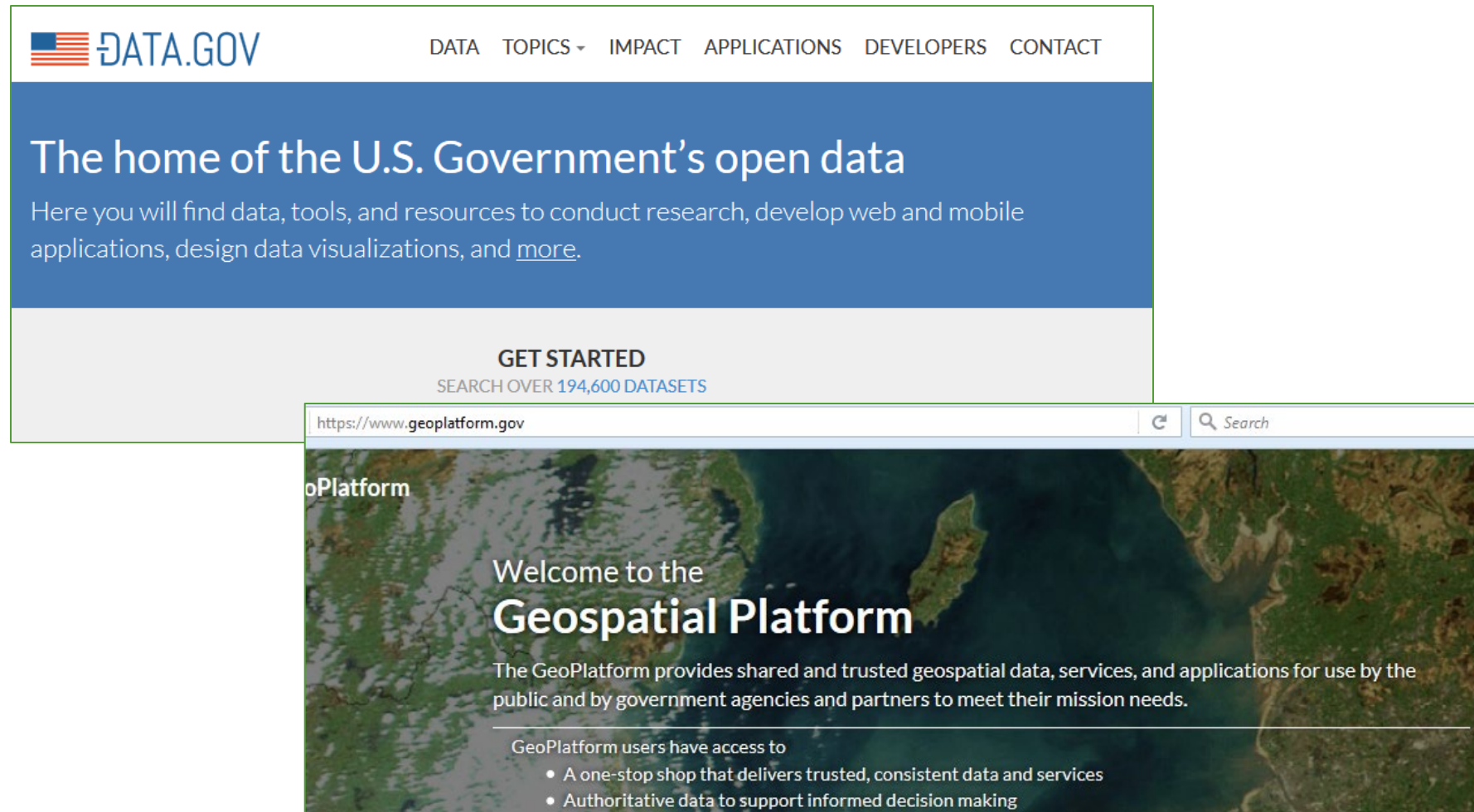
Enterprise Data Warehouse (EDW) Content Request

This worksheet provides information for the Content Governance Board in evaluating your request to include content in the Enterprise Data Warehouse (EDW) or publish Forest Service data to Data.gov. For requests to publish data to Data.gov, see fields indicated with **DATA.GOV**.

To submit a request (We are here to help. Contact the EDW Operations Team if you have questions):

data.gov & geoplatform.gov

- Other public facing outlets for RDW data



The image shows two overlapping screenshots of government websites. The top screenshot is the homepage of data.gov, featuring the logo, navigation menu, and a blue banner with the text 'The home of the U.S. Government's open data'. The bottom screenshot is the homepage of geoplatform.gov, showing a satellite map background with the text 'Welcome to the Geospatial Platform' and a list of services.

data.gov DATA TOPICS ▾ IMPACT APPLICATIONS DEVELOPERS CONTACT

The home of the U.S. Government's open data

Here you will find data, tools, and resources to conduct research, develop web and mobile applications, design data visualizations, and [more](#).

GET STARTED
SEARCH OVER 194,600 DATASETS

https://www.geoplatform.gov Search

oPlatform

Welcome to the
Geospatial Platform

The GeoPlatform provides shared and trusted geospatial data, services, and applications for use by the public and by government agencies and partners to meet their mission needs.

GeoPlatform users have access to

- A one-stop shop that delivers trusted, consistent data and services
- Authoritative data to support informed decision making

FSGeodata Clearinghouse

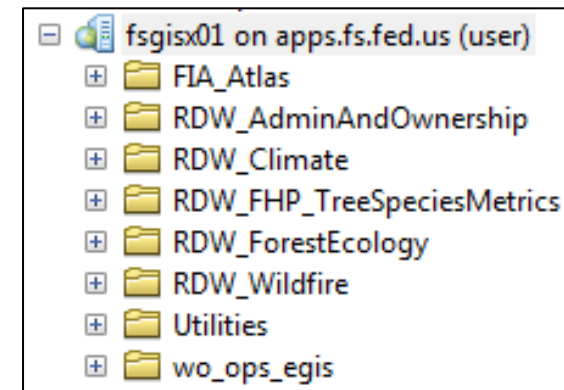
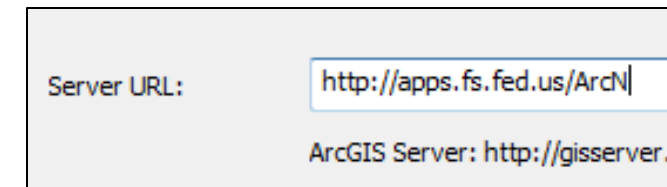
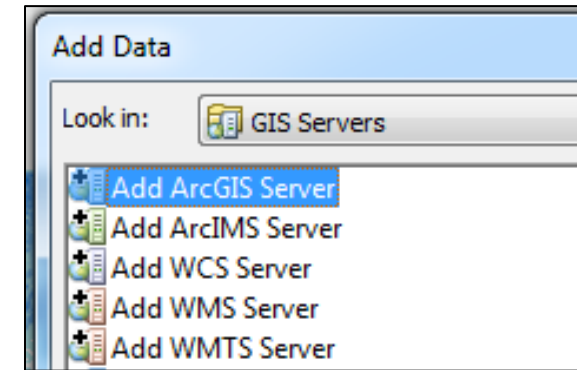
- Download datasets including national forest type, biomass, and post-fire vegetation conditions

data.fs.usda.gov/geodata/rastergateway/index.php

The screenshot shows the FSGeodata Clearinghouse website. At the top left is the USDA logo with the text "United States Department of Agriculture Forest Service". At the top right is the "FSGeodata Clearinghouse" title and the Forest Service shield logo. Below the header is a navigation bar with links for "Clearinghouse Home", "Help", and "Contact Us". A left sidebar contains a menu with categories: "Enterprise Data" (with sub-items: Downloadable Data, Data Extract Tool, Data.gov Open Data, Map Services, ArcGIS Open Data), "Maps" (with sub-items: FSTopo, Standard Map Products, Other Map Products), and "Raster Data". The main content area features a "Raster Data Gateway" section with a blue highlighted text box stating: "Rasters are digital aerial photographs, imagery from satellites, digital pictures, or even scanned maps. The Forest Service creates raster datasets for some Forest Service projects." Below this are two featured project boxes: "Caribbean Island Land Cover" which includes a map of the Caribbean Islands and text about "Land Cover and Forest Formations data" for Puerto Rico and its outlying islands; and "Chugach National Forest" which includes a photo of a forest sign and text about "Interactive CD Updates Data files for the 2003 CD" and a "GIS Theme Index".

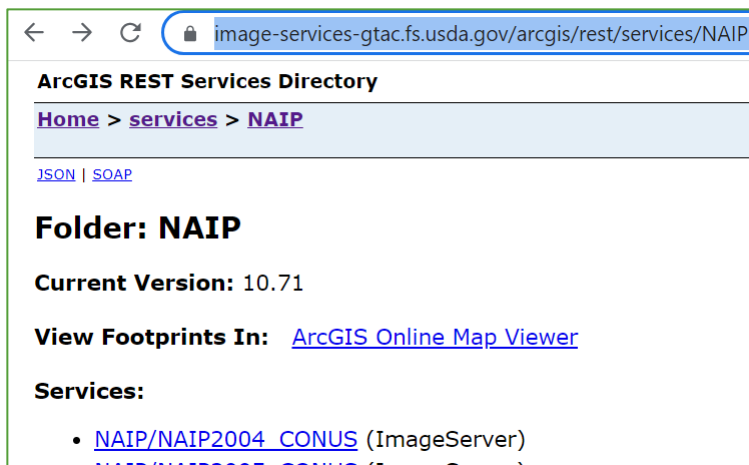
Access IS and RDW Server in Arc

1. Go to “**Add Data**”, click on the “**Look in**” drop down, and select “**GIS Servers**”
2. Double click on “**Add ArcGIS Server**” and press “**Add**”
3. Ensure “**Use GIS services**” is selected and click on **Next**.
4. In the **Server URL** field, type in one of the following addresses:
 - Image Services: <https://image-services-gtac.fs.usda.gov/arcgis>
 - Internal RDW Map: <https://apps.fs.usda.gov/arcn/services>
 - Internal RDW Raster: <https://apps.fs.usda.gov/fsgisn01/services>
 - External RDW Map: <https://apps.fs.usda.gov/arcx/services>
 - External RDW Raster: <https://apps.fs.usda.gov/fsgisx01/services>



Access IS & RDW Outside of ArcGIS

- Server REST pages
 - REST: REpresentational State Transfer (type of web service)
 - Most basic way to access the server data
 - Pages include service descriptions and metadata
 - Links to various way to view data including AGOL



← → ↻ image-services-gtac.fs.usda.gov/arcgis/rest/services/NAIP

ArcGIS REST Services Directory

[Home](#) > [services](#) > [NAIP](#)

[JSON](#) | [SOAP](#)

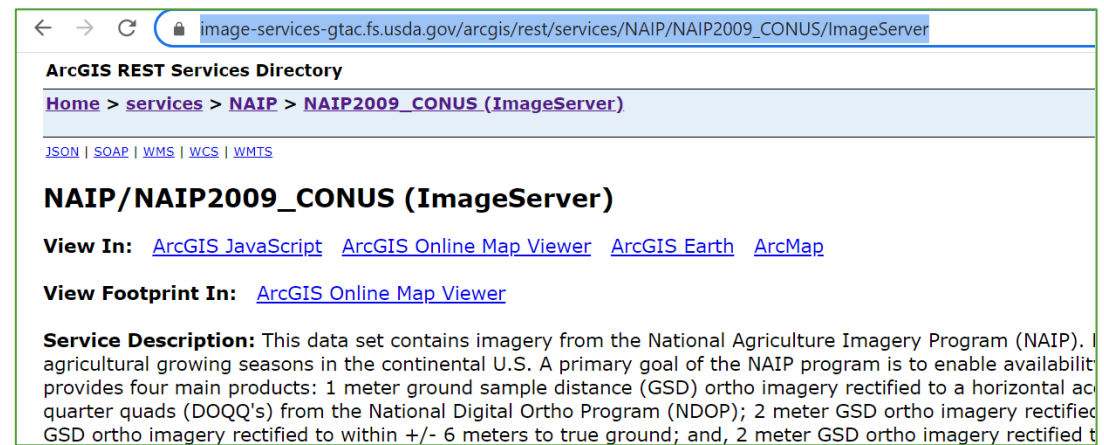
Folder: NAIP

Current Version: 10.71

View Footprints In: [ArcGIS Online Map Viewer](#)

Services:

- [NAIP/NAIP2004_CONUS](#) (ImageServer)
- [NAIP/NAIP2009_CONUS](#) (ImageServer)



← → ↻ image-services-gtac.fs.usda.gov/arcgis/rest/services/NAIP/NAIP2009_CONUS/ImageServer

ArcGIS REST Services Directory

[Home](#) > [services](#) > [NAIP](#) > [NAIP2009_CONUS](#) (ImageServer)

[JSON](#) | [SOAP](#) | [WMS](#) | [WCS](#) | [WMTS](#)

NAIP/NAIP2009_CONUS (ImageServer)

View In: [ArcGIS JavaScript](#) [ArcGIS Online Map Viewer](#) [ArcGIS Earth](#) [ArcMap](#)

View Footprint In: [ArcGIS Online Map Viewer](#)

Service Description: This data set contains imagery from the National Agriculture Imagery Program (NAIP). It covers agricultural growing seasons in the continental U.S. A primary goal of the NAIP program is to enable availability of high resolution imagery for agricultural planning and analysis. The program provides four main products: 1 meter ground sample distance (GSD) ortho imagery rectified to a horizontal datum; 2 meter GSD ortho imagery rectified to a horizontal datum; 2 meter GSD ortho imagery rectified to within +/- 6 meters to true ground; and, 2 meter GSD ortho imagery rectified to within +/- 6 meters to true ground.

Access IS and RDW in AGOL

- [ArcGIS Online \(AGOL\)](#)

- Cloud based WebGIS
- Share maps, apps, data, etc...
- Doesn't work well with Chrome
- Must [setup account](#):



WebGIS Requests & Consultation - Request ArcGIS Online (AGOL) Access

[Homepage](#) | [Index of Requests](#) | [WebGIS consultation request](#) | [AGOL access request](#) | [WebGIS Sharepoint](#)

Business Need

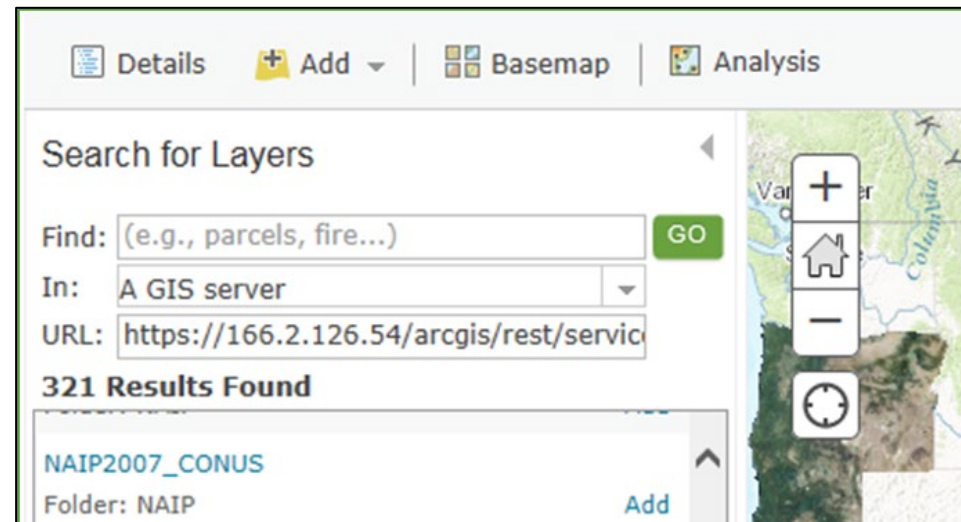
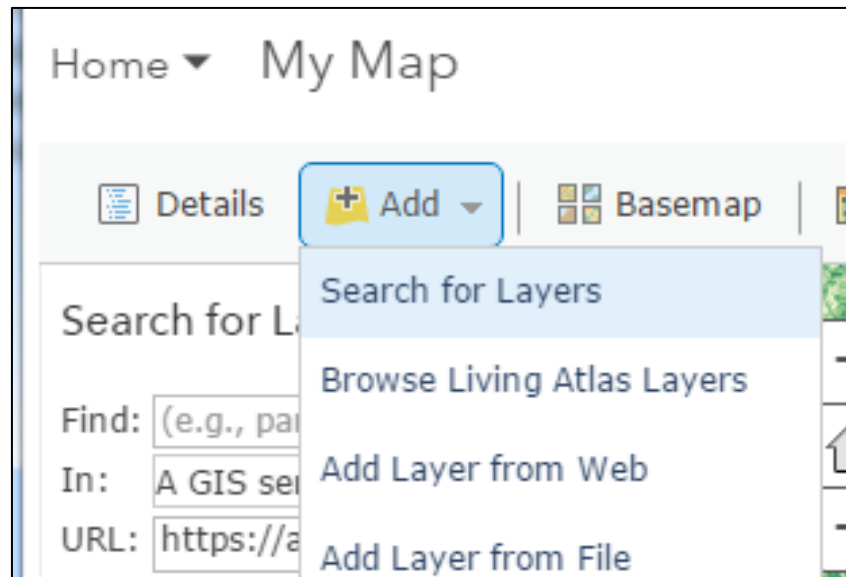
Requestor Name:*

Requestor Email:*

Requestor Phone#:*

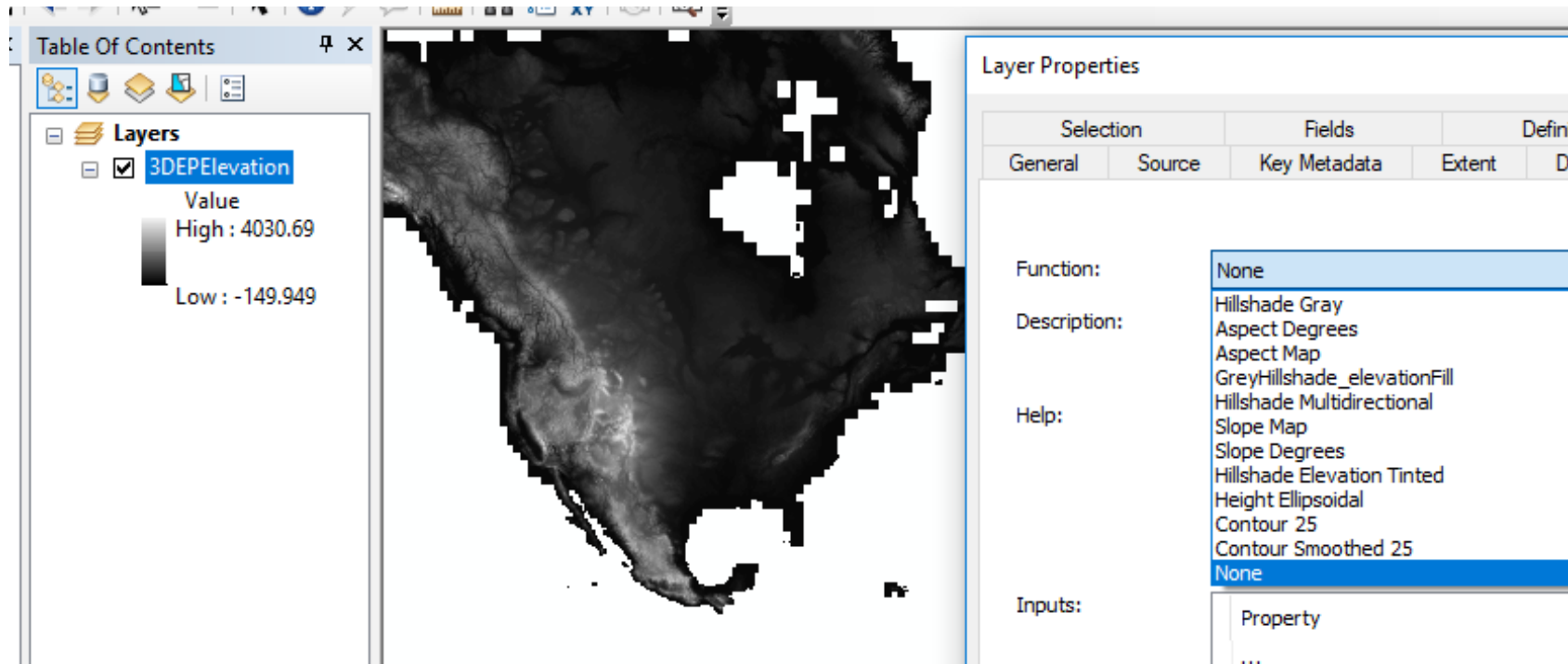
Access IS and RDW in AGOL

- AGOL already has small collection of NAIP
 - Can't change band combo
- Add servers in AGOL
 - In the Map menu, click **Add | Search for Layers**
 - In: **A GIS server**



USGS Elevation Data

- Image Services no longer has CONUS elevation
- Instead use USGS 3DEP service:
<https://elevation.nationalmap.gov/arcgis/rest/services>



Summary of Links

- RDW sharepoint: <https://usdagcc.sharepoint.com/sites/fs-cio-edwts/SitePages/RDW.aspx>
- Internal RDW Map: <https://apps.fs.usda.gov/arcn/rest/services>
- Internal RDW Raster: <https://apps.fs.usda.gov/fsgisn01/rest/services>
- External RDW Map: <https://apps.fs.usda.gov/arcx/rest/services>
- External RDW Raster: <https://apps.fs.usda.gov/fsgisx01/rest/services>
- FSGeodata Clearinghouse: <https://data.fs.usda.gov/geodata/rastergateway/index.php>

- Image Services: <https://image-services-gtac.fs.usda.gov/arcgis>
- Image Services website: <https://apps.fs.usda.gov/gtac/products#imageservices>
- Image Services data addition requests: SM.FS.GTAC@usda.gov
- Image Services REST page: <https://image-services-gtac.fs.usda.gov/arcgis/rest/services>

- AGOL: usfs.maps.arcgis.com
- AGOL account setup: https://apps.fs.usda.gov/gtac-tools/AGOL/request_access.php
- APFO: <https://www.fsa.usda.gov/programs-and-services/aerial-photography/>
- GeoSpatial Data Gateway: <https://gdg.sc.egov.usda.gov/>
- USGS CONUS elevation data: <https://elevation.nationalmap.gov/arcgis/rest/services>