GIScience

Finding Data

Image from NASA:
https://commons.wikimedia.org/wiki/File:Earth_Western_Hemisphere_transparent_background.png#filelinks

WV VIEW

AmericaView℠
Empowering Earth Observation Education
AmericaView.org - Est. 2003

Common Data

1. Boundaries
2. Infrastructure (roads, railroads, power lines, pipelines, sidewalks, buildings, airports, train terminals, etc.)
3. Natural features (land cover, soil data, geology, climate data, water bodies, physiography, etc.)
4. Land ownership
5. Parcels
6. Census data
7. Imagery (aerial and satellite)
8. Digital elevation models (DEMs)
9. Contours
10. Topographic maps (Digital Raster Graphics)
11. Etc.

Data Sources in West Virginia

- West Virginia GIS Technical Center
- http://wvgis.wvu.edu/

The West Virginia GIS Technical Center provides statewide GIS services to advance the State's Spatial Data Infrastructure

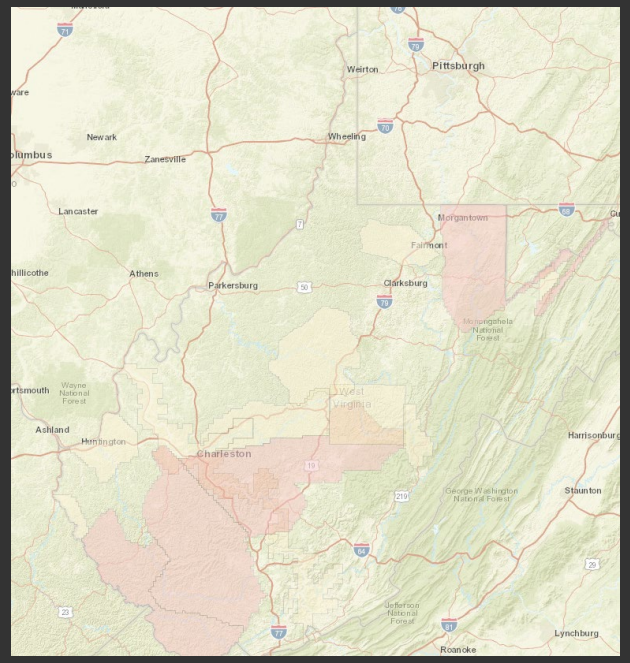
A few of these services include the State Data Clearinghouse, a GIS People Directory, and the MapWV.gov web mapping portal

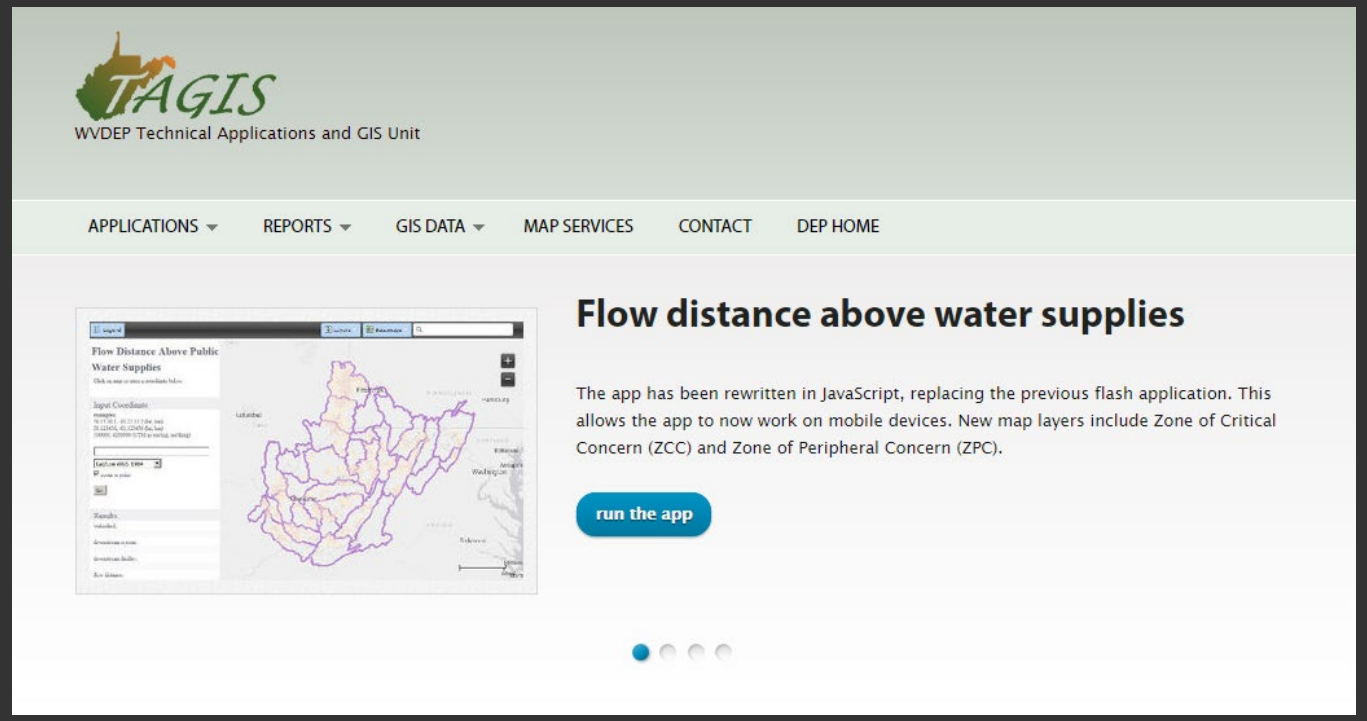
WV GIS Technical Center
WVU Department of Geology & Geography
330 Brooks Hall
P.O. Box 6300
Morgantown, WV 26506
Phone: (304) 293-0557
Fax: (304) 293-6522

http://wvgis.wvu.edu/data/data.php

Data Sources in West Virginia

- West Virginia DEP TAGIS
  - Mine permits
  - Oil and gas well data
  - LiDAR

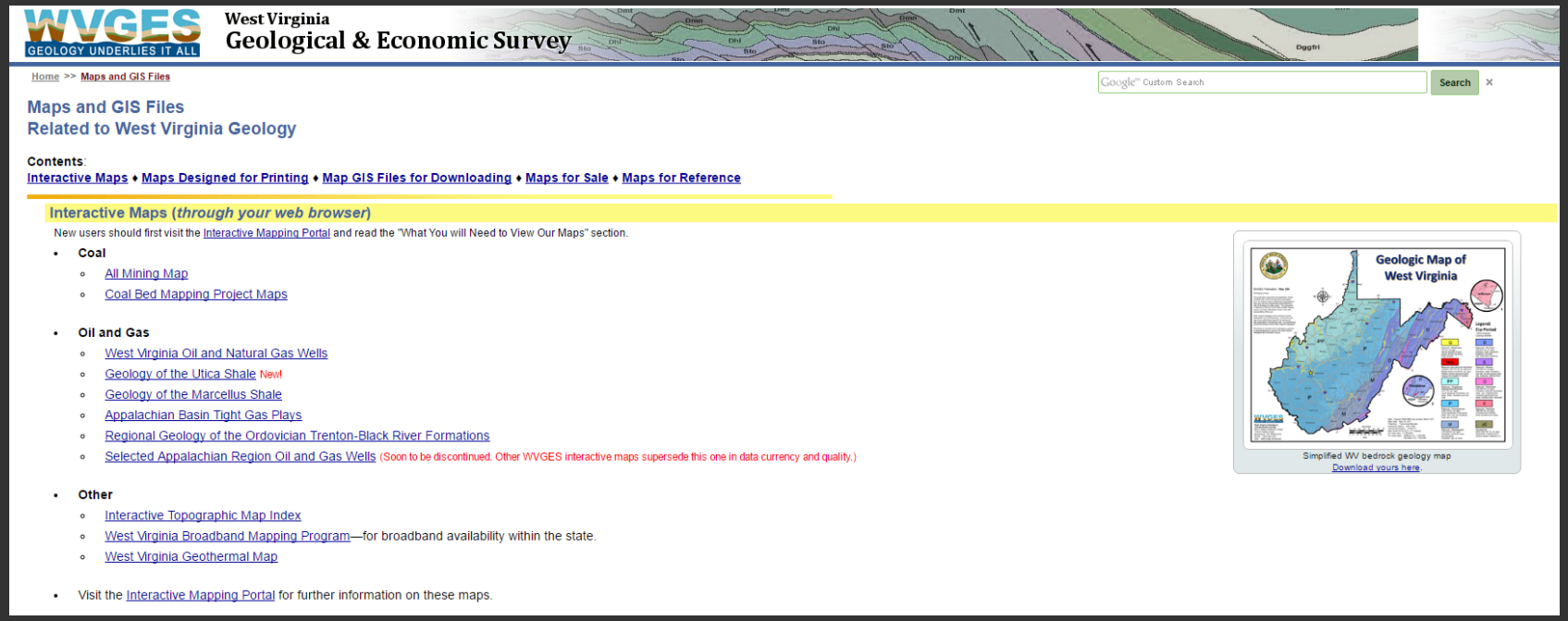




https://tagis.dep.wv.gov/site/

Data Sources in West Virginia

- WVGES
  - Coal
  - Oil and gas
  - Marcellus data
  - Geology



WVGES GEOLOGY UNDERLIES IT ALL — West Virginia Geological & Economic Survey

Home >> Maps and GIS Files

Google™ Custom Search — Search

Maps and GIS Files
Related to West Virginia Geology

Contents:
Interactive Maps ♦ Maps Designed for Printing ♦ Map GIS Files for Downloading ♦ Maps for Sale ♦ Maps for Reference

Interactive Maps (*through your web browser*)

New users should first visit the Interactive Mapping Portal and read the "What You will Need to View Our Maps" section.

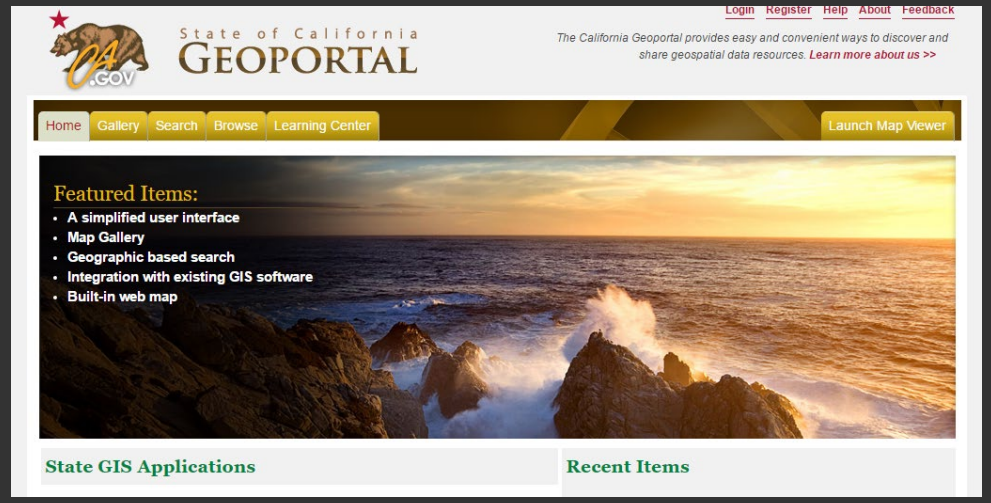
- **Coal**
  - All Mining Map
  - Coal Bed Mapping Project Maps
- **Oil and Gas**
  - West Virginia Oil and Natural Gas Wells
  - Geology of the Utica Shale New!
  - Geology of the Marcellus Shale
  - Appalachian Basin Tight Gas Plays
  - Regional Geology of the Ordovician Trenton-Black River Formations
  - Selected Appalachian Region Oil and Gas Wells (Soon to be discontinued. Other WVGES interactive maps supersede this one in data currency and quality.)
- **Other**
  - Interactive Topographic Map Index
  - West Virginia Broadband Mapping Program—for broadband availability within the state.
  - West Virginia Geothermal Map
- Visit the Interactive Mapping Portal for further information on these maps.

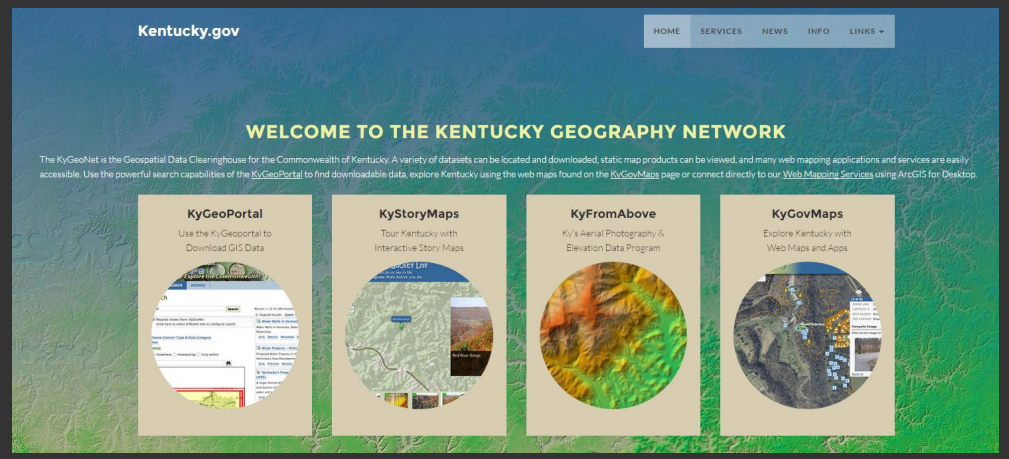
Geologic Map of West Virginia

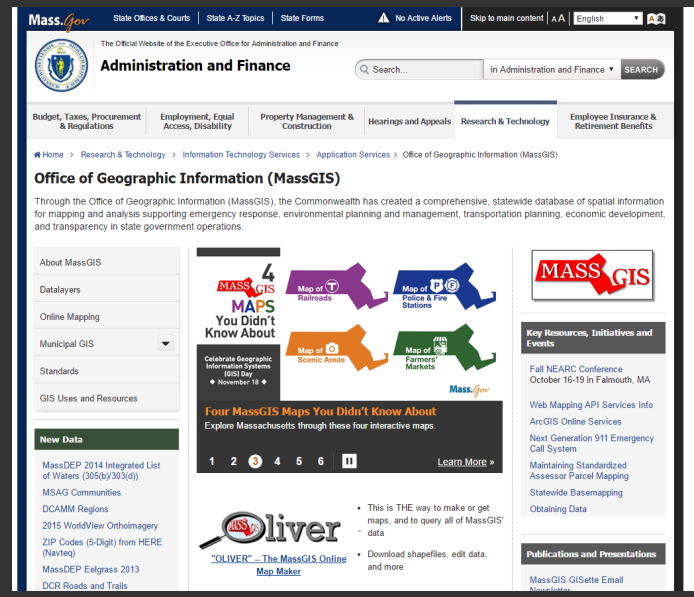
Simplified WV bedrock geology map
Download yours here.

http://www.wvgs.wvnet.edu/www/maps/maps.htm

GIS Data for Other States





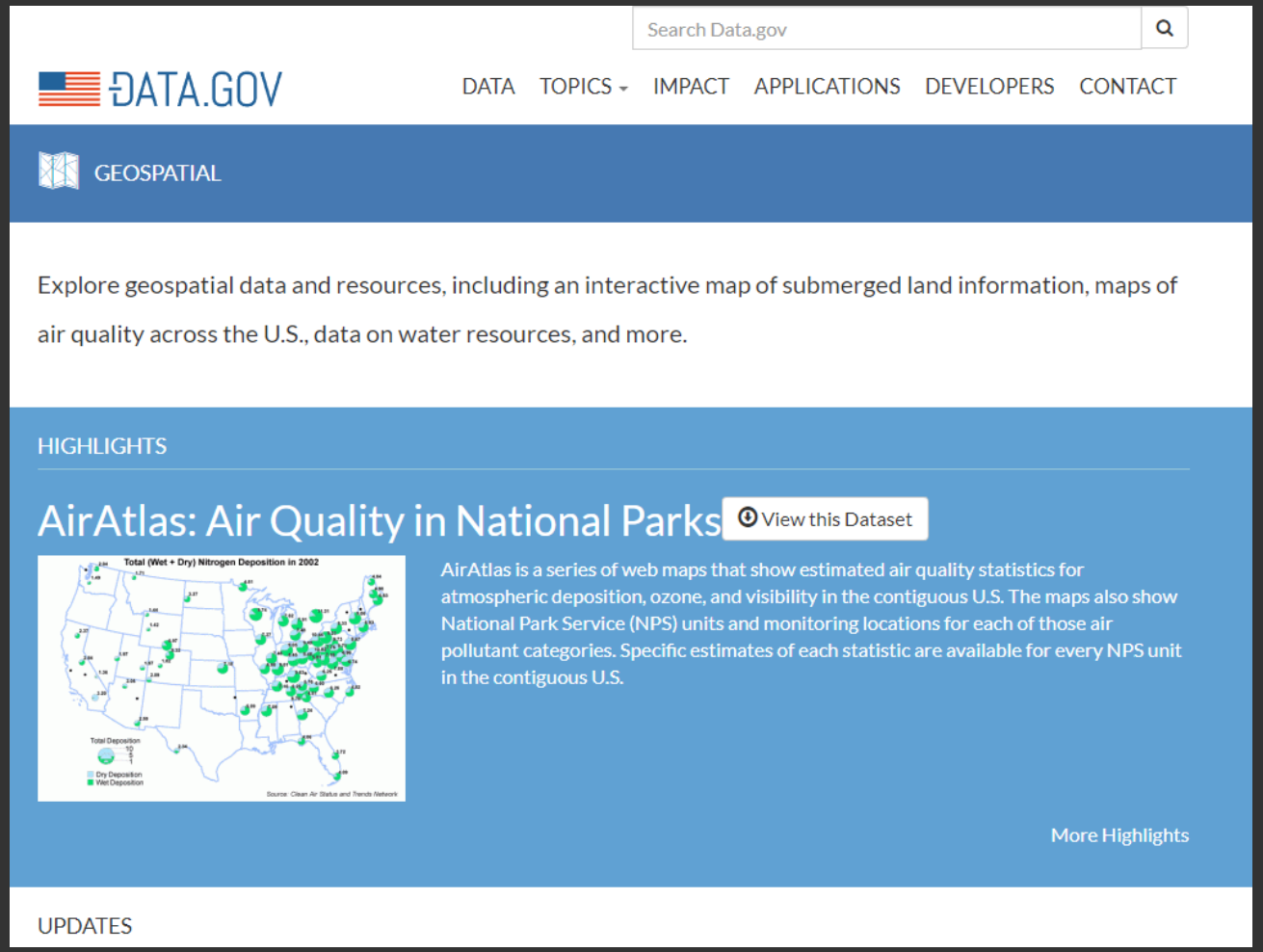


Data for the US

Some national datasets:

1. US census TIGER data
2. National Hydrography Dataset (NHD/NHD Plus)
3. National Elevation Dataset (NED)
4. National Land Cover Dataset (NLCD)
5. Aerial Imagery
6. National Agriculture Imagery Program (NAIP)
7. Topographic Maps (DRGs)
8. Soil data (STATSGO/SSURGO)
9. National Wetland Inventory (NWI)

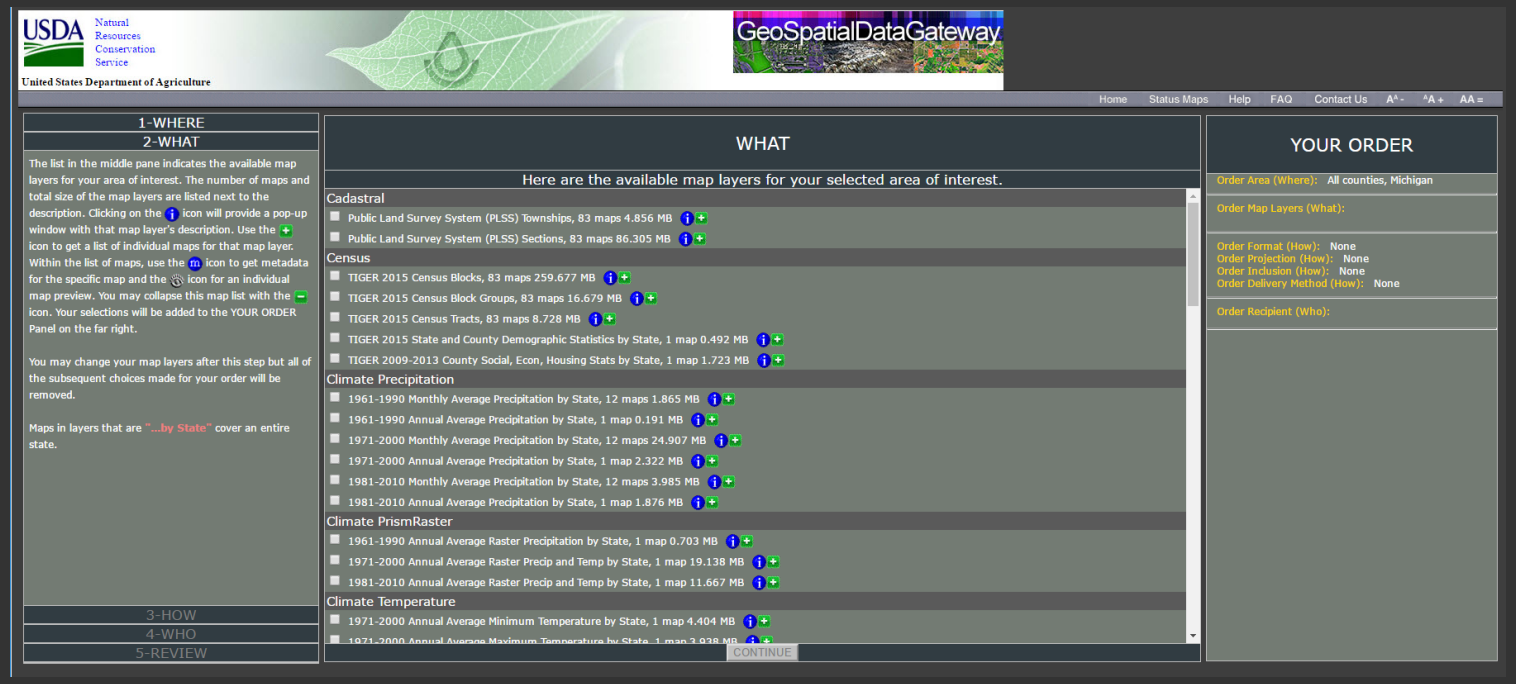
Data for the US



https://www.data.gov/geospatial/

Data for the US

- NRCS Geospatial Gateway
- https://gdg.sc.egov.usda.gov/



https://datagateway.nrcs.usda.gov/

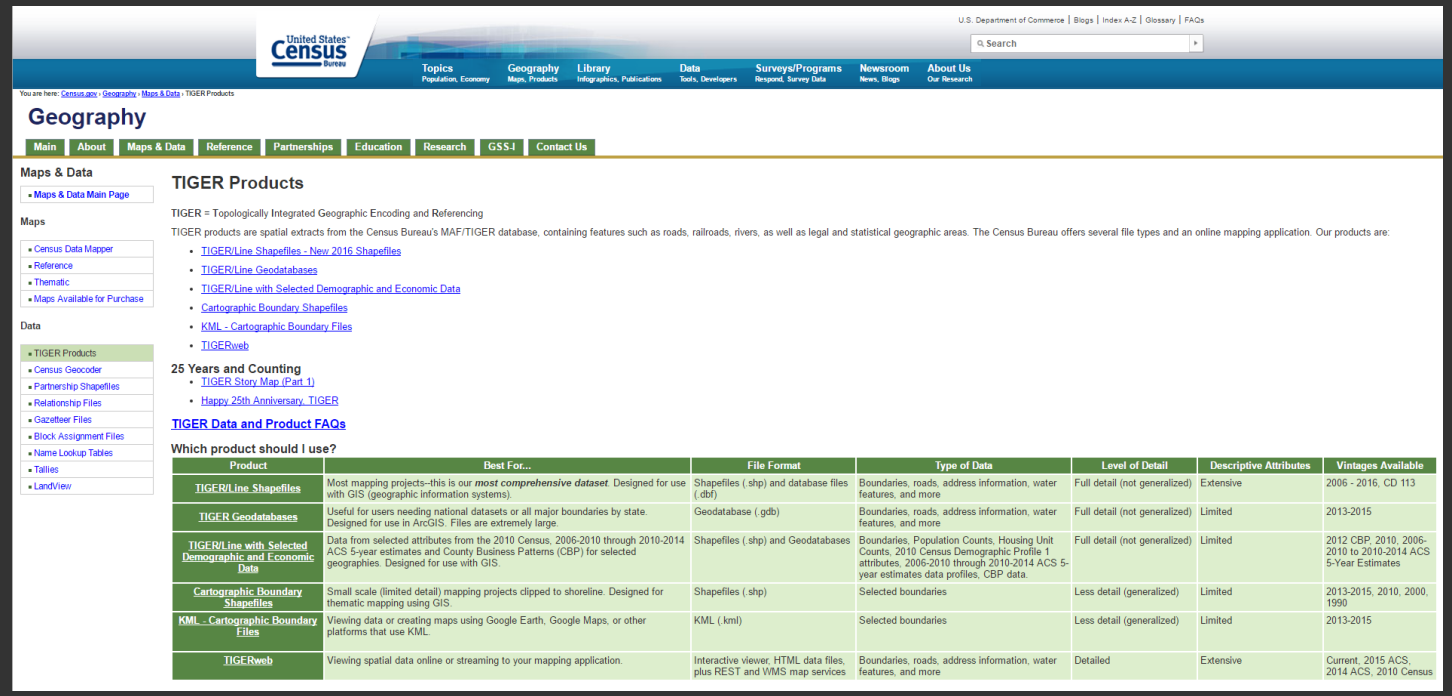
Data for the US

- National Map
  - Geographic names
  - Elevation
  - Orthoimagery
  - Land cover
  - Topographic maps
  - Hydrography (surface water)
  - Transportation
  - Structures
  - Public land
  - Government units

http://nationalmap.gov/

Data for US

- US Census
- Topologically Integrated Geographic Encoding Referencing



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United States Census Bureau

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You are here: Census.gov › Geography › Maps & Data › TIGER Products

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Maps & Data

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Data

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- Gazetteer Files
- Block Assignment Files
- Name Lookup Tables
- Tallies
- LandView

TIGER Products

TIGER = Topologically Integrated Geographic Encoding and Referencing

TIGER products are spatial extracts from the Census Bureau's MAF/TIGER database, containing features such as roads, railroads, rivers, as well as legal and statistical geographic areas. The Census Bureau offers several file types and an online mapping application. Our products are:

- TIGER/Line Shapefiles - New 2016 Shapefiles
- TIGER/Line Geodatabases
- TIGER/Line with Selected Demographic and Economic Data
- Cartographic Boundary Shapefiles
- KML - Cartographic Boundary Files
- TIGERweb

25 Years and Counting

- TIGER Story Map (Part 1)
- Happy 25th Anniversary, TIGER

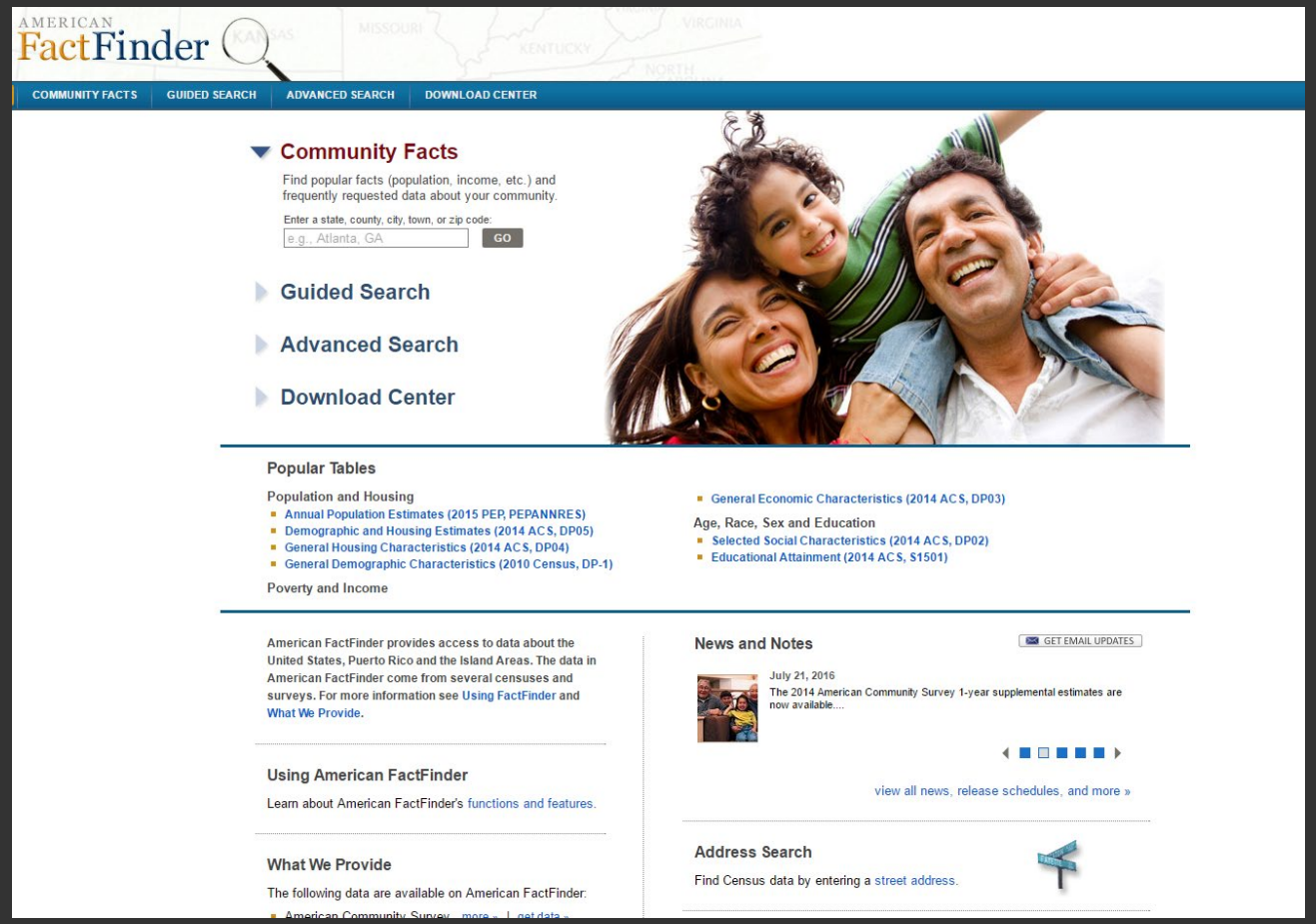
TIGER Data and Product FAQs

Which product should I use?

Product	Best For...	File Format	Type of Data	Level of Detail	Descriptive Attributes	Vintages Available
TIGER/Line Shapefiles	Most mapping projects--this is our *most comprehensive dataset*. Designed for use with GIS (geographic information systems).	Shapefiles (.shp) and database files (.dbf)	Boundaries, roads, address information, water features, and more	Full detail (not generalized)	Extensive	2006 - 2016, CD 113
TIGER Geodatabases	Useful for users needing national datasets or all major boundaries by state. Designed for use in ArcGIS. Files are extremely large.	Geodatabase (.gdb)	Boundaries, roads, address information, water features, and more	Full detail (not generalized)	Limited	2013-2015
TIGER/Line with Selected Demographic and Economic Data	Data from selected attributes from the 2010 Census, 2006-2010 through 2010-2014 ACS 5-year estimates and County Business Patterns (CBP) for selected geographies. Designed for use with GIS.	Shapefiles (.shp) and Geodatabases	Boundaries, Population Counts, Housing Unit Counts, 2010 Census Demographic Profile 1 attributes, 2006-2010 through 2010-2014 ACS 5-year estimates data profiles, CBP data.	Full detail (not generalized)	Limited	2012 CBP, 2010, 2006-2010 to 2010-2014 ACS 5-Year Estimates
Cartographic Boundary Shapefiles	Small scale (limited detail) mapping projects clipped to shoreline. Designed for thematic mapping using GIS.	Shapefiles (.shp)	Selected boundaries	Less detail (generalized)	Limited	2013-2015, 2010, 2000, 1990
KML - Cartographic Boundary Files	Viewing data or creating maps using Google Earth, Google Maps, or other platforms that use KML.	KML (.kml)	Selected boundaries	Less detail (generalized)	Limited	2013-2015
TIGERweb	Viewing spatial data online or streaming to your mapping application.	Interactive viewer, HTML data files, plus REST and WMS map services	Boundaries, roads, address information, water features, and more	Detailed	Extensive	Current, 2015 ACS, 2014 ACS, 2010 Census

https://www.census.gov/geo/maps-data/data/tiger.html

US Data

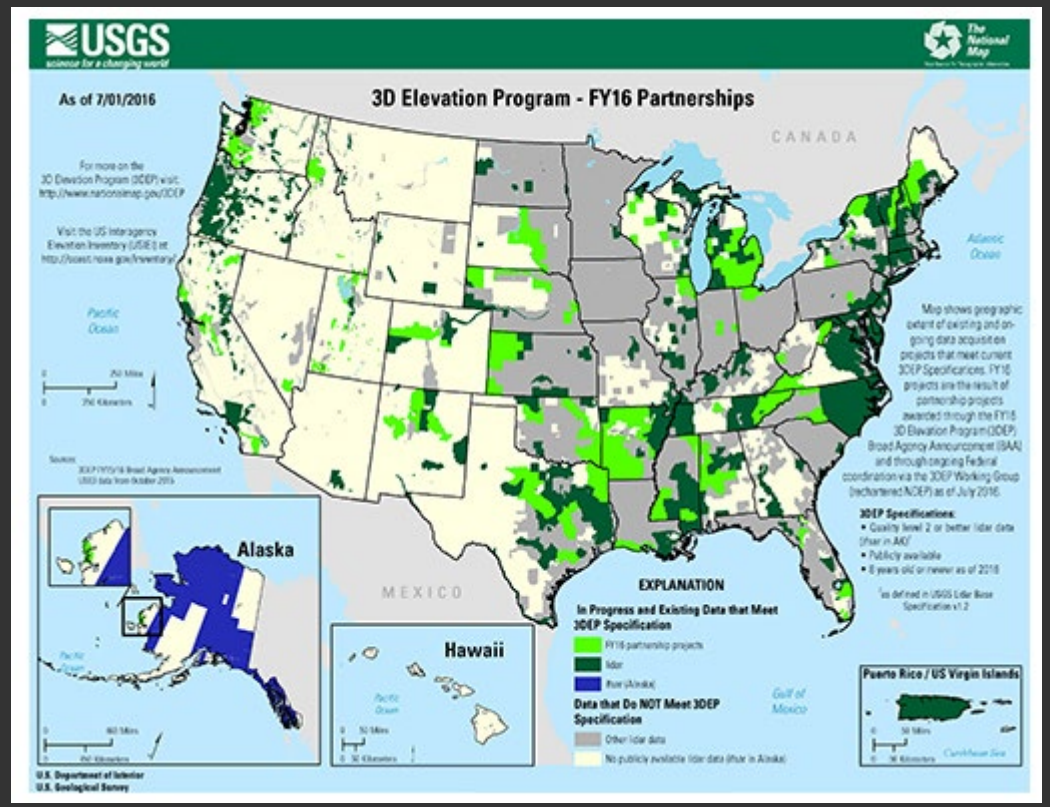


- American Fact Finder

https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

National Elevation Dataset (NED)

- Available at multiple scales (30 m, 10 m, 3 m)
- Products vary by location
- Currently working toward high res products from LiDAR (3DEP program)



https://nationalmap.gov/3DEP/

Hydrography

- National Hydrography Dataset
- Watersheds Boundaries Dataset

Hydrography

Data on America's surface waters are available from the USGS in the **National Hydrography Dataset (NHD)**. The NHD includes datasets covering all streams and lakes at scales of 1:24,000 and 1:100,000. In some areas, the NHD is being supplemented with data larger than 1:24,000-scale. The NHD provides a true network that supports the analysis of any type of movement (for example, navigation, sediment transport, and effluent dispersion) by surface waters. Further information and data download are available at https://nhd.usgs.gov/.

The **Watershed Boundary Dataset (WBD)** defines the areal extent of surface water drainage to a point, accounting for all land and surface areas. Watershed boundaries are determined solely upon science-based hydrologic principles, not favoring any administrative boundaries or special projects, nor a particular program or agency. The intent of defining Hydrologic Units (HUs) for the WBD is to establish a base-line drainage boundary framework. At a minimum, the WBD is being delineated and geo-referenced to the USGS 1:24,000 scale topographic base maps, except for Alaska at 1:63,360 scale, and 1:25,000 scale in the Caribbean, to meet National Map Accuracy Standards. More information is available at https://nhd.usgs.gov/wbd.html.

National Hydrography Dataset Model -- *May 27, 2014* (Plot size 36"x48"; 1.8MB Get Adobe Reader)

https://nhd.usgs.gov/

Soil Data

STATSGO = General state-level data (State Soil Geographic Database)

SSURGO = Specific county-level data (Soil Survey Geographic Database)

USDA Natural Resources Conservation Service
Soils
United States Department of Agriculture

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Description of SSURGO Database

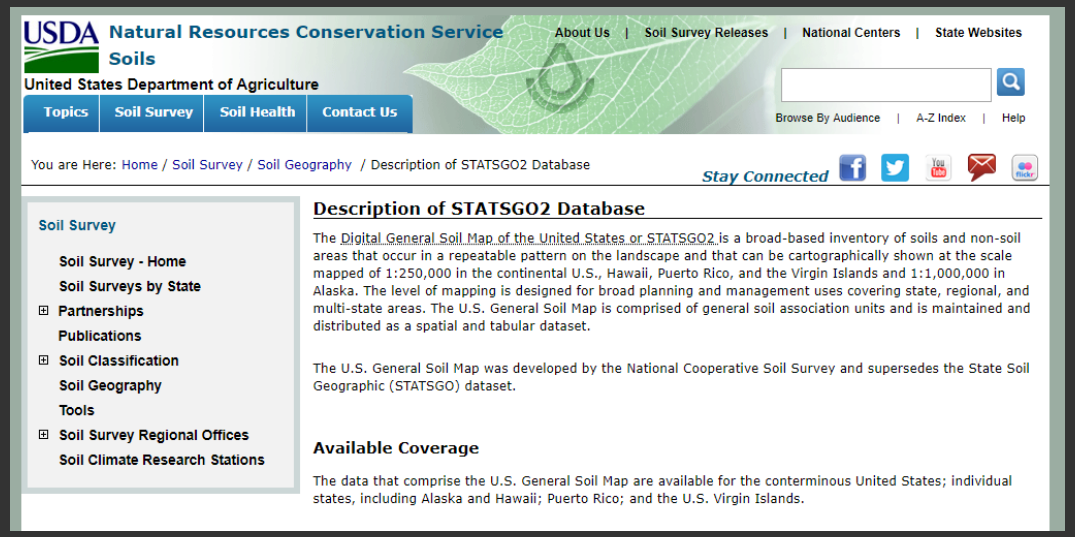
The SSURGO database contains information about soil as collected by the National Cooperative Soil Survey over the course of a century. The information can be displayed in tables or as maps and is available for most areas in the United States and the Territories, Commonwealths, and Island Nations served by the USDA-NRCS. The information was gathered by walking over the land and observing the soil. Many soil samples were analyzed in laboratories. The maps outline areas called map units. The map units describe soils and other components that have unique properties, interpretations, and productivity. The information was collected at scales ranging from 1:12,000 to 1:63,360. More details were gathered at a scale of 1:12,000 than at a scale of 1:63,360. The mapping is intended for natural resource planning and management by landowners, townships, and counties. Some knowledge of soils data and map scale is necessary to avoid misunderstandings.

The maps are linked in the database to information about the component soils and their properties for each map unit. Each map unit may contain one to three major components and some minor components. The map units are typically named for the major components. Examples of information available from the database include available water capacity, soil reaction, electrical conductivity, and frequency of flooding; yields for cropland, woodland, rangeland, and pastureland; and limitations affecting recreational development, building site development, and other engineering uses.

SSURGO datasets consist of map data, tabular data, and information about how the maps and tables were created. The extent of a SSURGO dataset is a soil survey area, which may consist of a single county, multiple counties, or parts of multiple counties. SSURGO map data can be viewed in the Web Soil Survey or downloaded in ESRI® Shapefile format. The coordinate systems are Geographic. Attribute data can be downloaded in text format that can be imported into a Microsoft® Access® database.

Status Map of Soil Surveys Available from the Web Soil Survey (PDF; 7.13 MB)

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627



USDA Natural Resources Conservation Service
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Description of STATSGO2 Database

The Digital General Soil Map of the United States or STATSGO2 is a broad-based inventory of soils and non-soil areas that occur in a repeatable pattern on the landscape and that can be cartographically shown at the scale mapped of 1:250,000 in the continental U.S., Hawaii, Puerto Rico, and the Virgin Islands and 1:1,000,000 in Alaska. The level of mapping is designed for broad planning and management uses covering state, regional, and multi-state areas. The U.S. General Soil Map is comprised of general soil association units and is maintained and distributed as a spatial and tabular dataset.

The U.S. General Soil Map was developed by the National Cooperative Soil Survey and supersedes the State Soil Geographic (STATSGO) dataset.

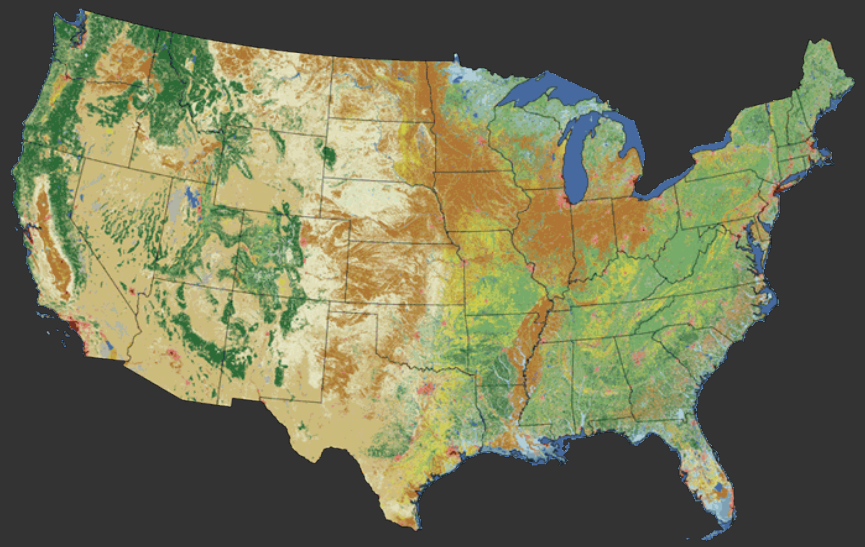
Available Coverage

The data that comprise the U.S. General Soil Map are available for the conterminous United States; individual states, including Alaska and Hawaii; Puerto Rico; and the U.S. Virgin Islands.

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_053629

National Land Cover Database (NLCD)

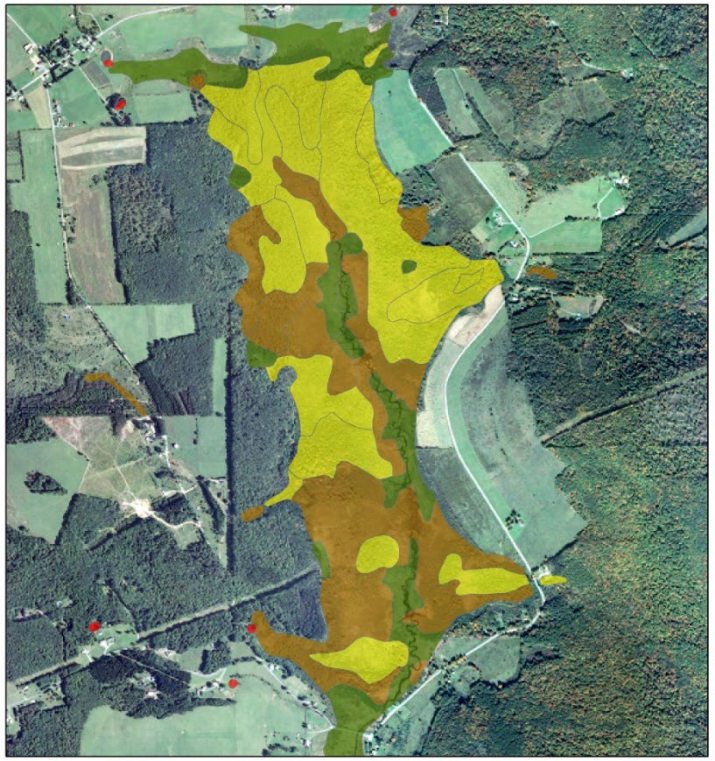
- 1992, 2001, 2006, 2011, 2016, 2019
- Land cover, land cover change, impervious surface, canopy cover
- http://www.mrlc.gov/



Multi-Resolution Land Characteristics Consortium (MRLC)

Class\ Value	Classification Description
Water	
11	**Open Water**- areas of open water, generally with less than 25% cover of vegetation or soil.
12	**Perennial Ice/Snow**- areas characterized by a perennial cover of ice and/or snow, generally greater than 25% of total cover.
Developed	
21	**Developed, Open Space**- areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
22	**Developed, Low Intensity**- areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.
23	**Developed, Medium Intensity** -areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.
24	**Developed High Intensity**-highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.
Barren	
31	**Barren Land (Rock/Sand/Clay)** - areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
Forest	
41	**Deciduous Forest**- areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
42	**Evergreen Forest**- areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
43	**Mixed Forest**- areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
Shrubland	
51	**Dwarf Scrub**- Alaska only areas dominated by shrubs less than 20 centimeters tall with shrub canopy typically greater than 20% of total vegetation. This type is often co-associated with grasses, sedges, herbs, and non-vascular vegetation.
52	**Shrub/Scrub**- areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.
Herbaceous	
71	**Grassland/Herbaceous**- areas dominated by gramanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.
72	**Sedge/Herbaceous**- Alaska only areas dominated by sedges and forbs, generally greater than 80% of total vegetation. This type can occur with significant other grasses or other grass like plants, and includes sedge tundra, and sedge tussock tundra.
73	**Lichens**- Alaska only areas dominated by fruticose or foliose lichens generally greater than 80% of total vegetation.
74	**Moss**- Alaska only areas dominated by mosses, generally greater than 80% of total vegetation.
Planted/Cultivated	
81	**Pasture/Hay**-areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
82	**Cultivated Crops** -areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.
Wetlands	
90	**Woody Wetlands**- areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.
95	**Emergent Herbaceous Wetlands**- Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

National Wetland Inventory (NWI)

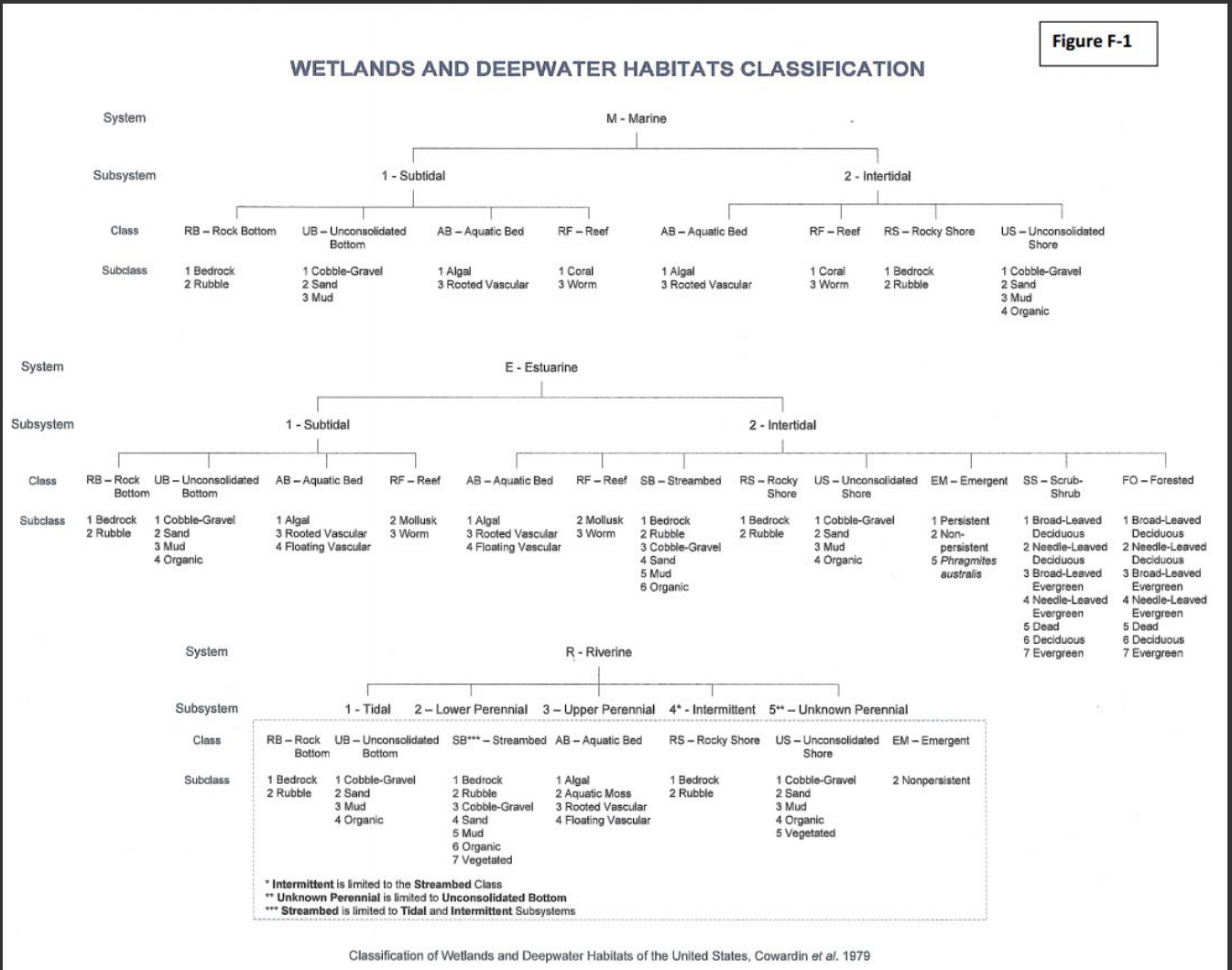


Palustrine Emergent
Palustrine Forested
Palustrine Scrub-Shrub
Other Palustrine

0.4 Miles

N

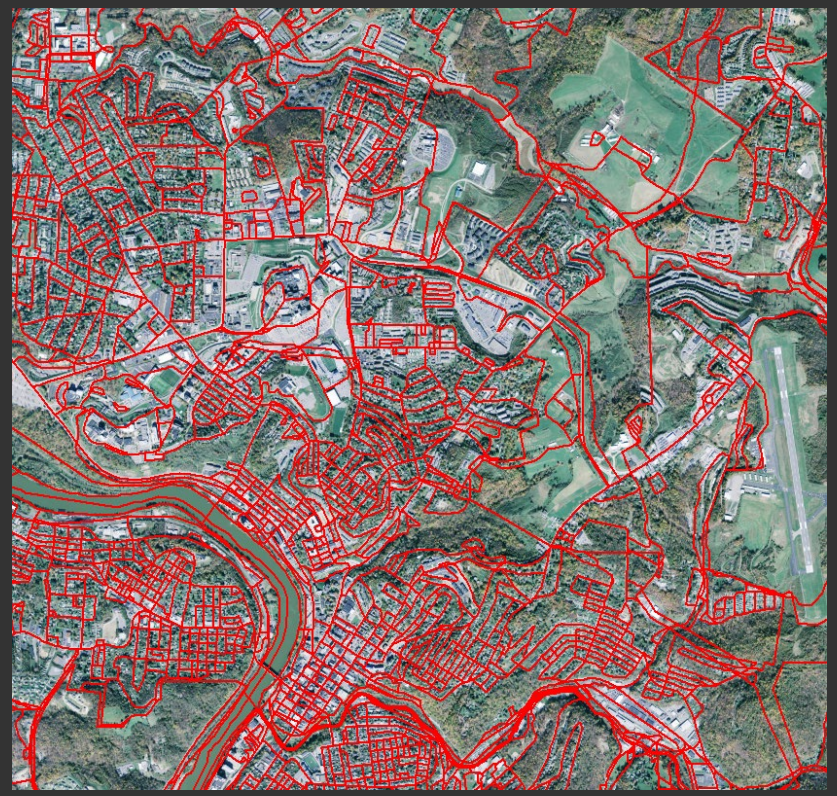
Imagery: NAIP
Wetlands: NWI



https://extension.unh.edu/resources/files/Resource001874_Rep2718.pdf

Census Data

- Decennial census
- Data collected
  - Population counts
  - Demographic data
  - TIGER/Line vector data (roads, other)
- Geographic units for Census
  - State > County > Tract > Block Group > Block
  - Populated places (Census designated places)
  - Urban areas/MSAs



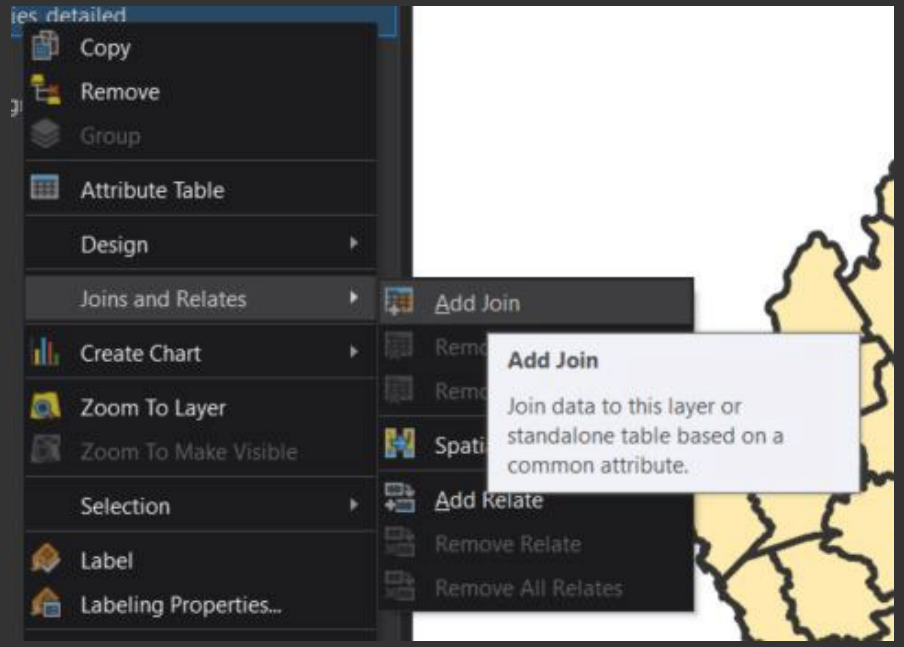
Tracts

Block Groups

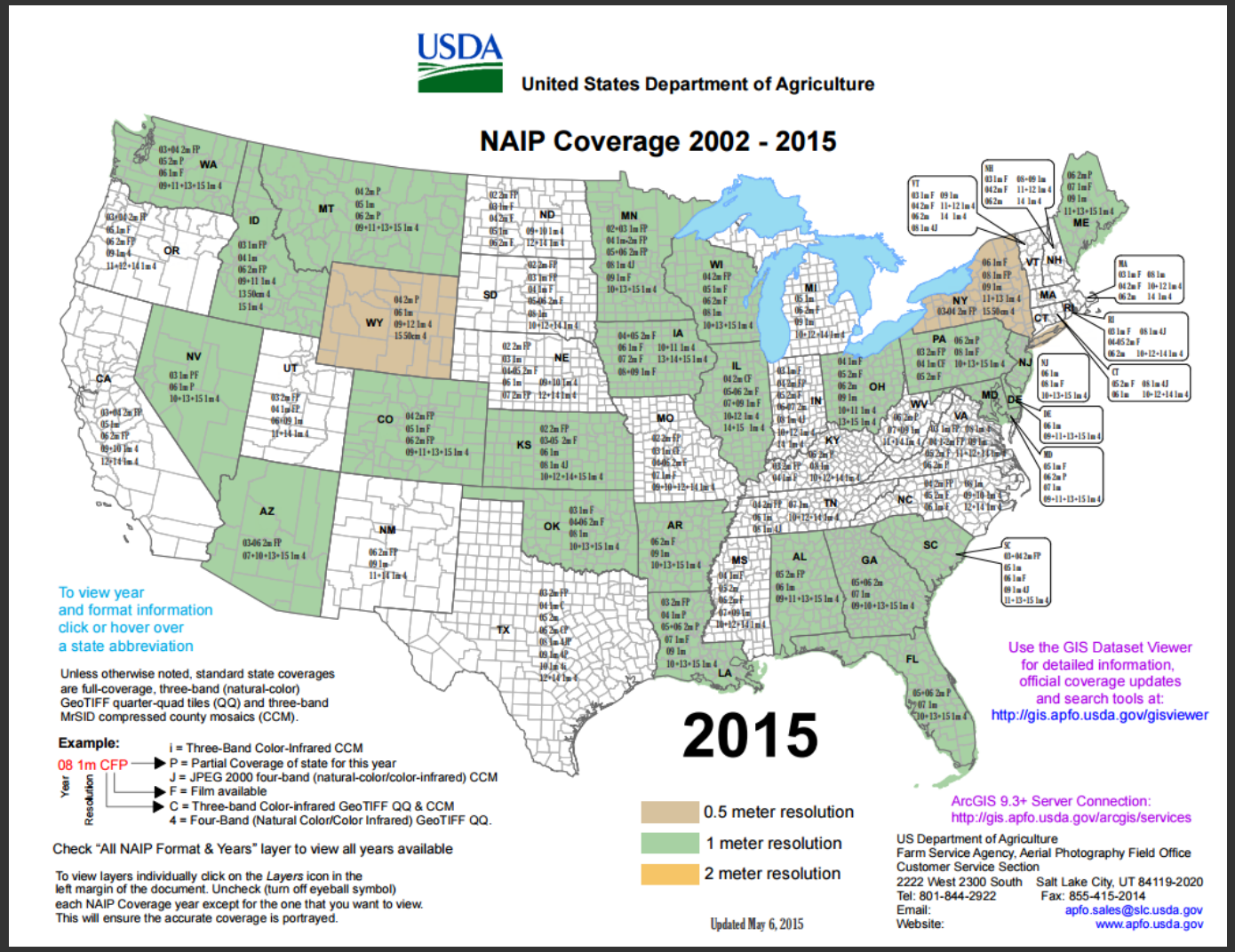
Blocks

Census Data

- Decennial Census data include vector line datasets (roads) and population counts at different levels of geography (county, tract, etc.)
- You can also obtain historic census data
- Can get data related to labor, employment, crime, health care, and income
- Can get tabular data and spatially join it to boundaries
- American Community Survey (ACS)



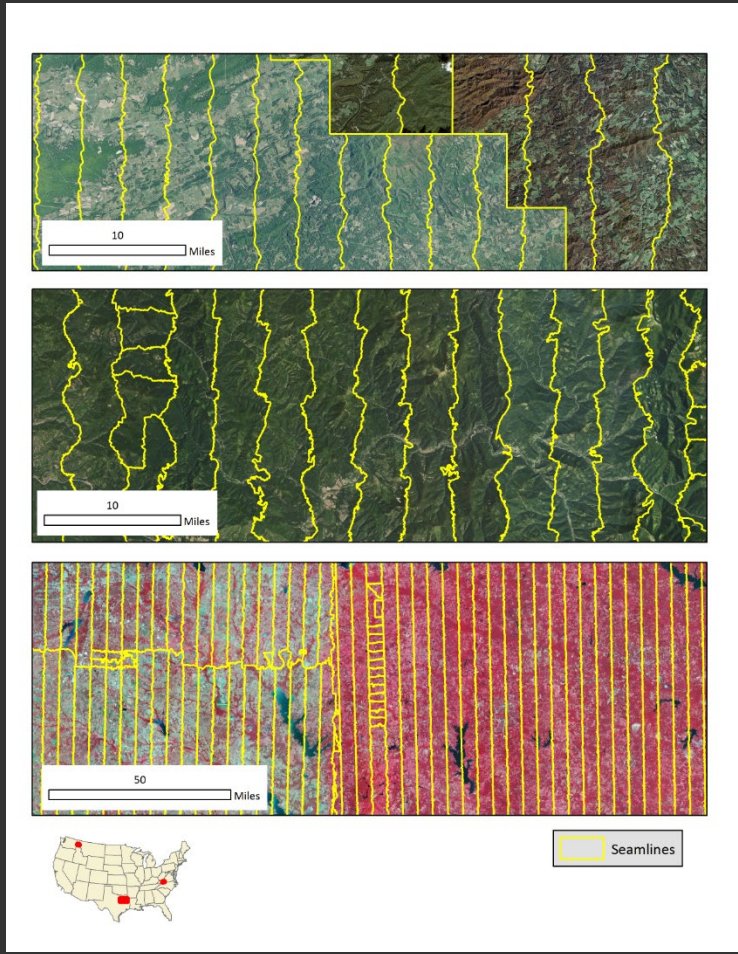
National Agriculture Imagery Program (NAIP)



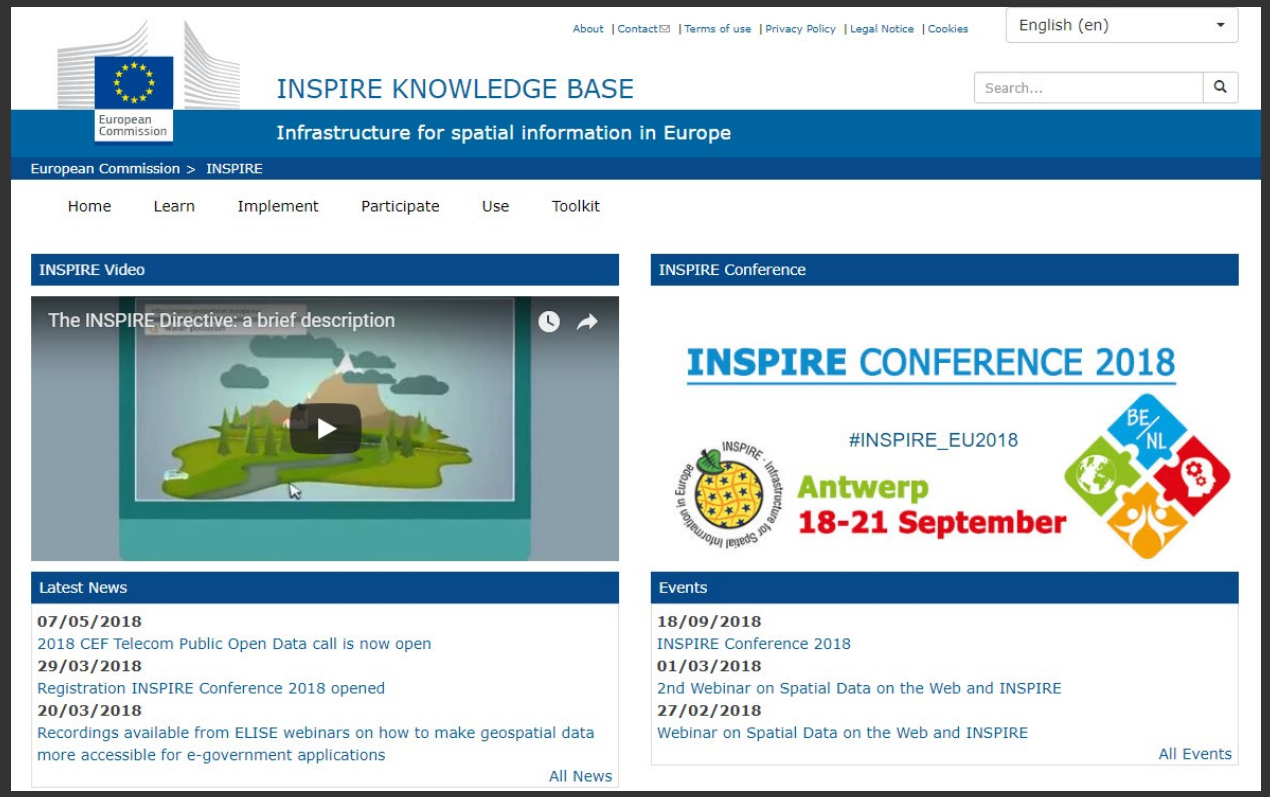
https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/APFO/NAIP_Covg_20150512.pdf

National Agriculture Imagery Program (NAIP)

- State coverages
- Collected every three years (often more frequently)
- 3-band or 4-band
- 1 m cell size
- Growing season conditions



Finding Data Internationally



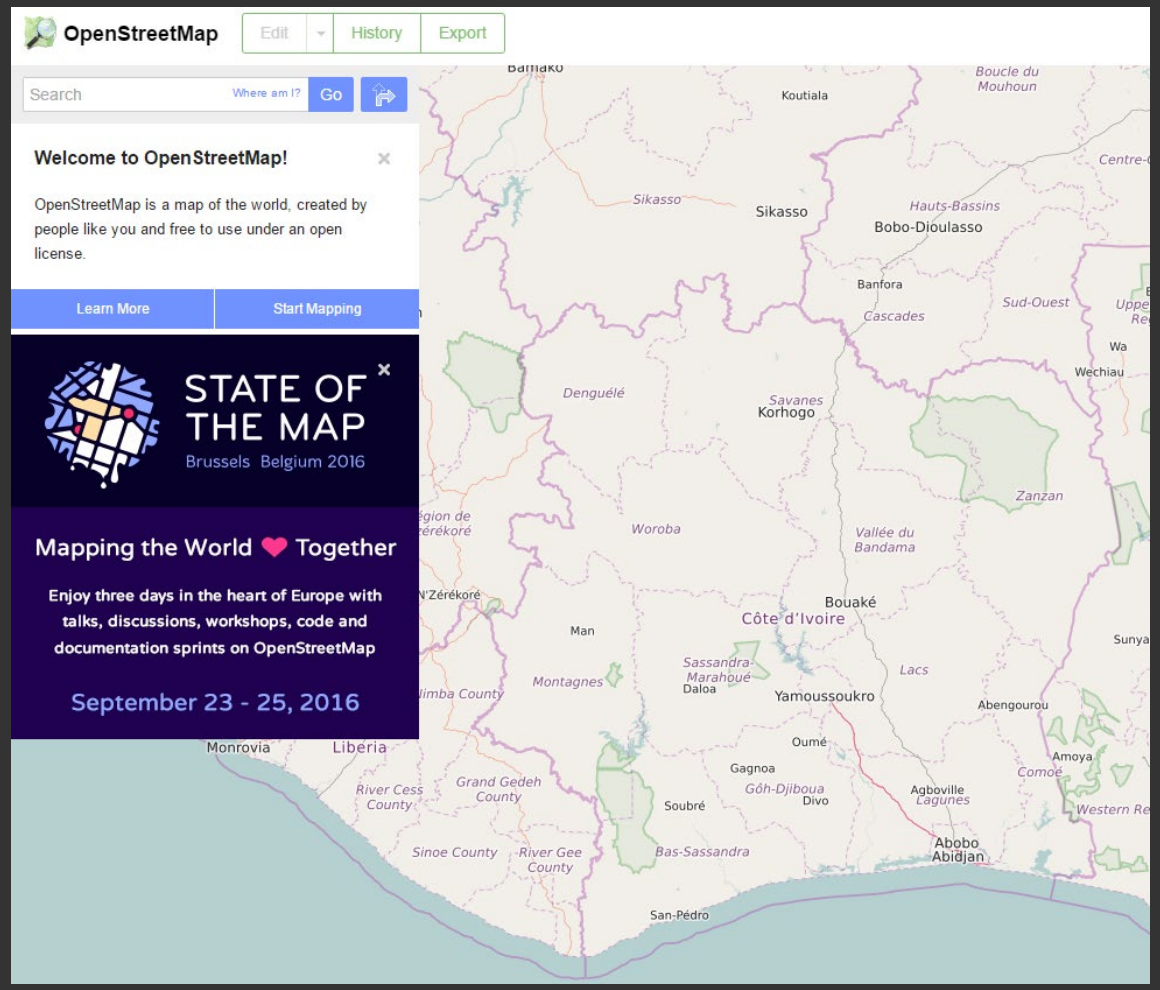
https://inspire.ec.europa.eu/

Finding Data Internationally

https://www.eionet.europa.eu/gis/

https://www.nrcan.gc.ca/earth-sciences/geography/topographic-information/free-data-geogratis/11042

Finding Data Internationally

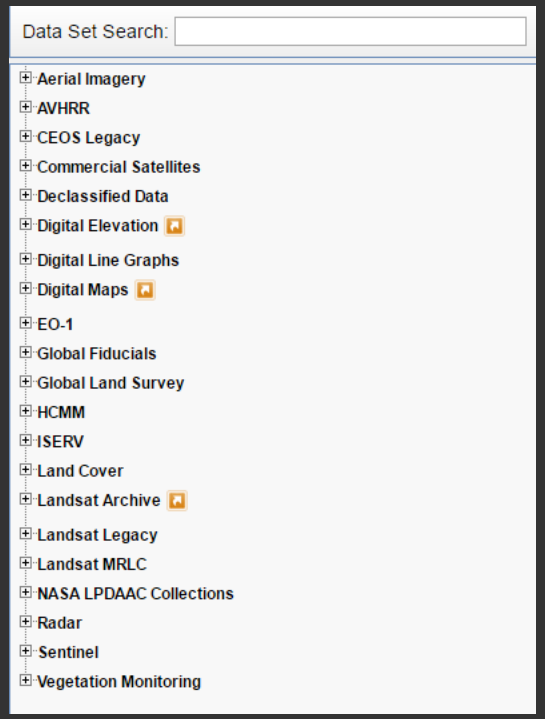


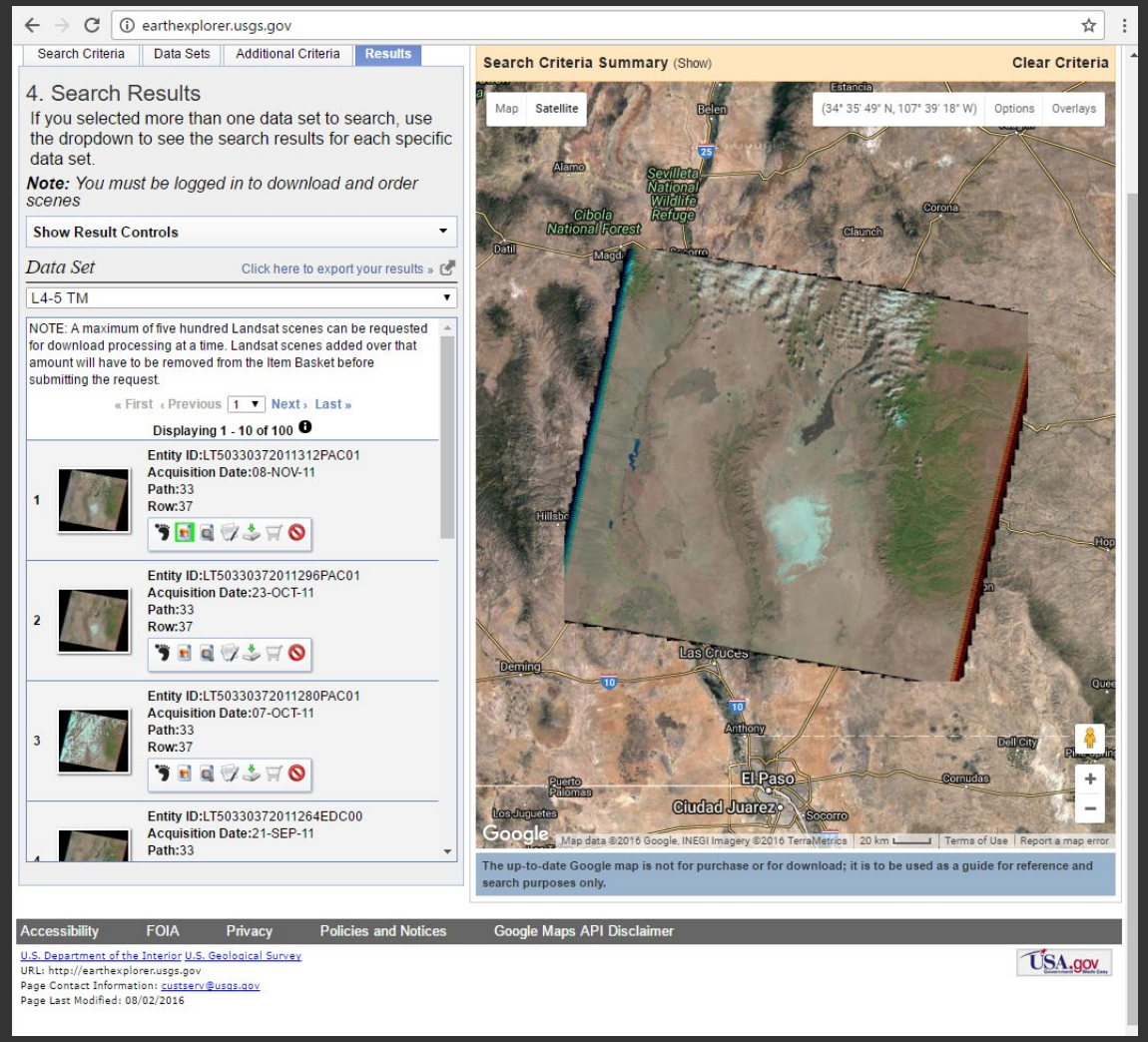
https://www.openstreetmap.org/

https://en.wikipedia.org/wiki/List_of_GIS_data_sources

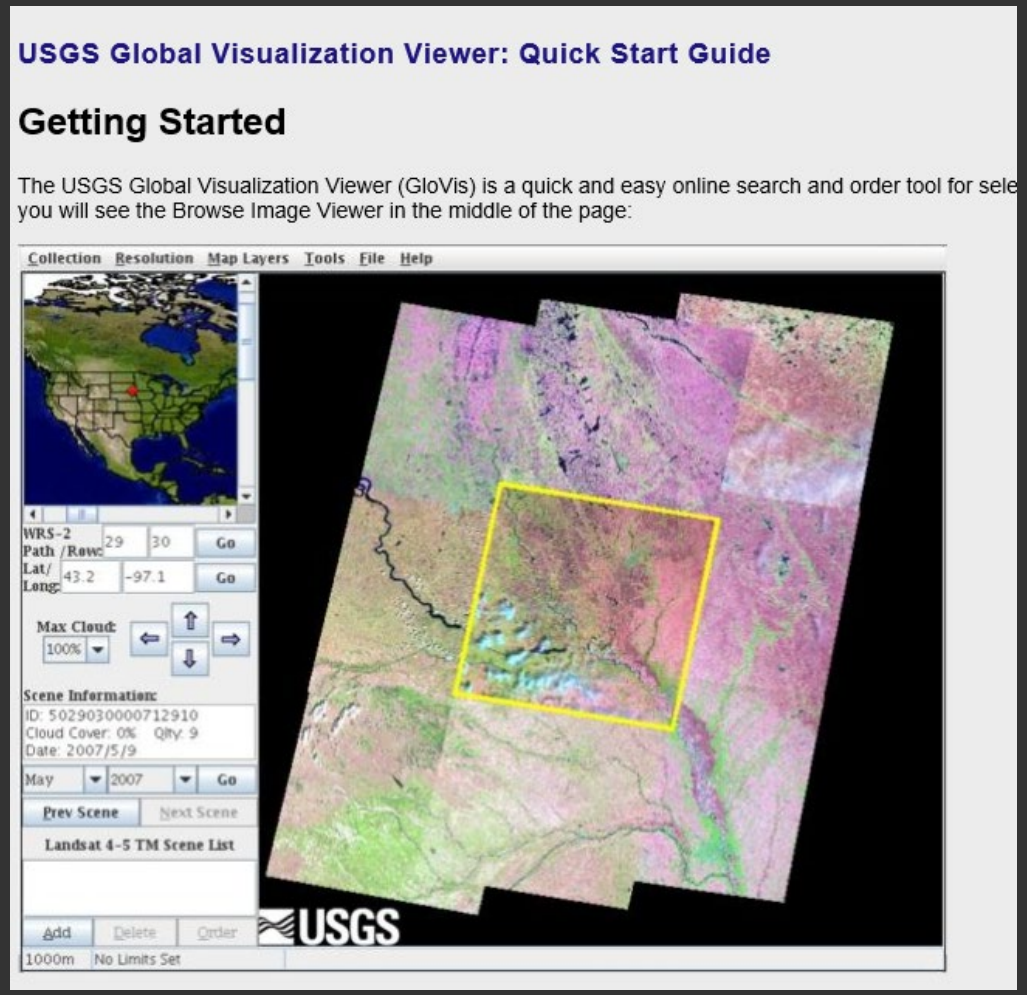
Finding Free Imagery

- USGS EarthExplorer
- http://earthexplorer.usgs.gov/



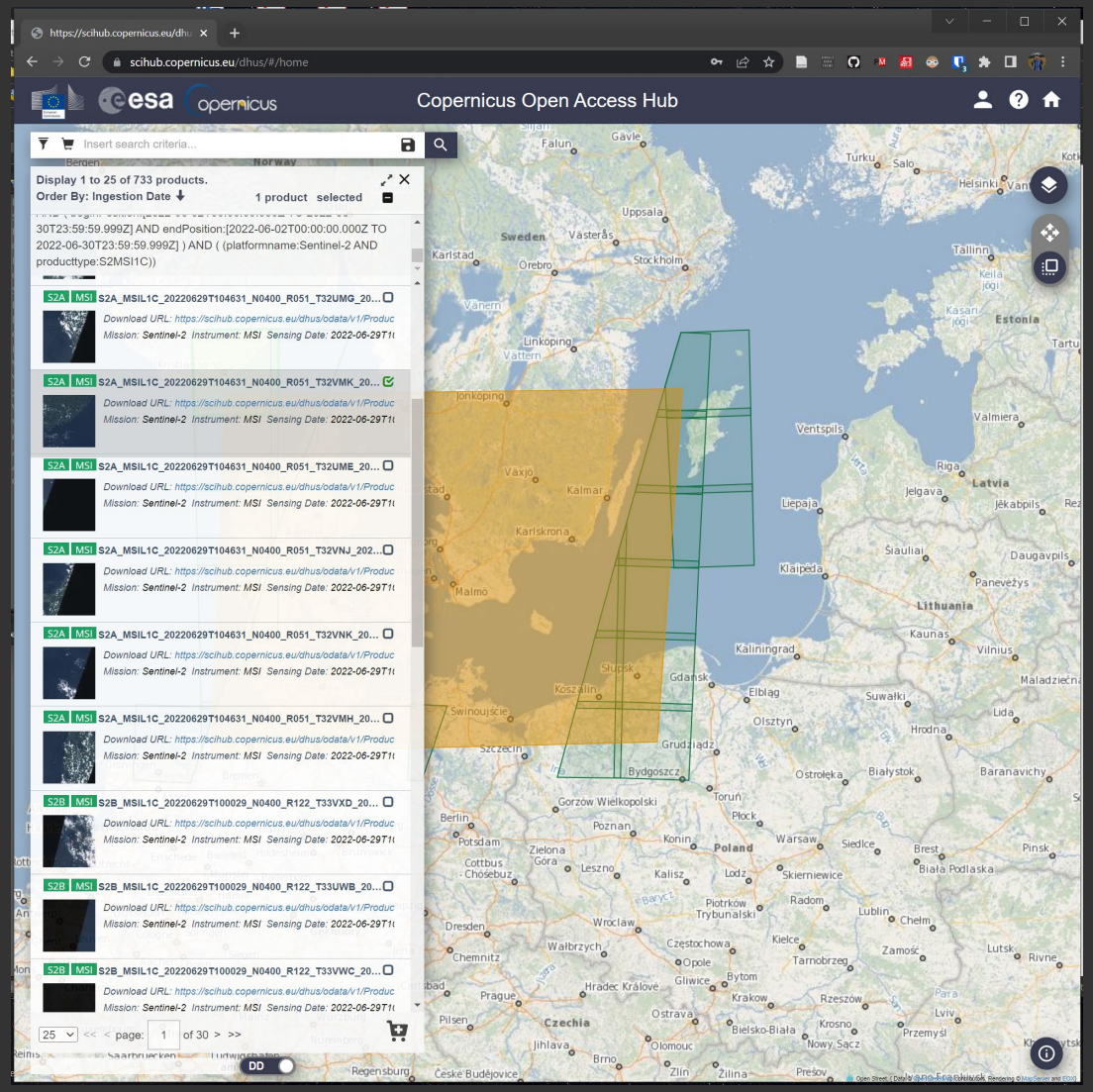


Finding Free Imagery



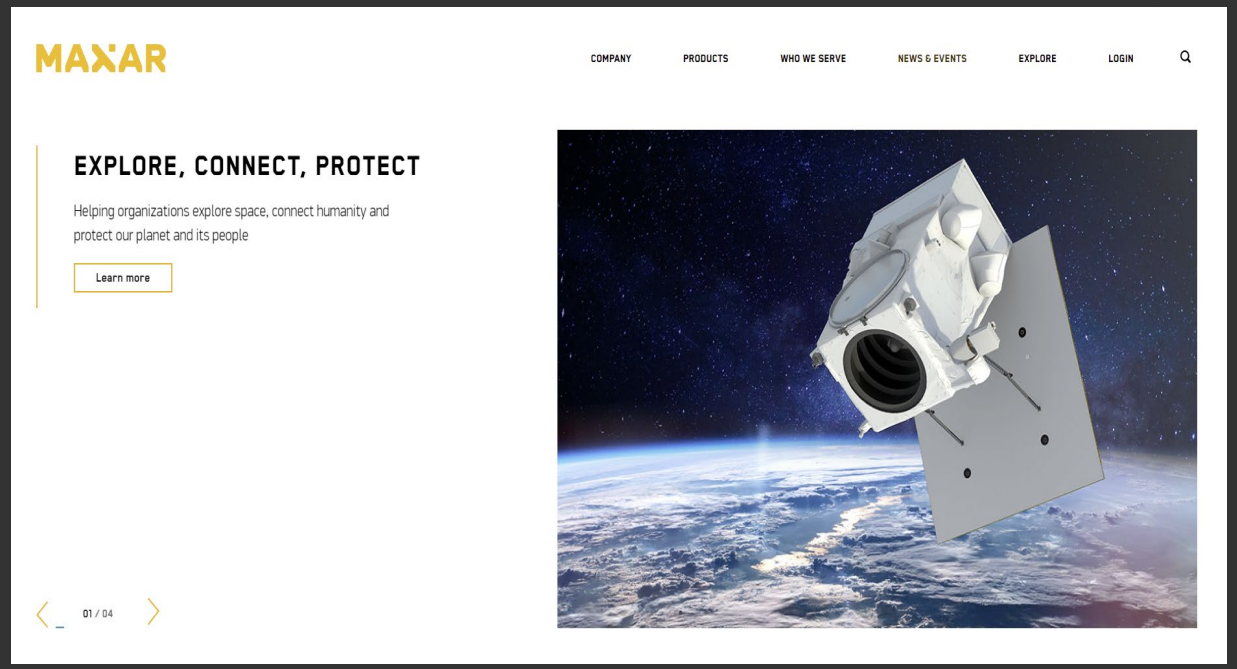
- USGS Global Visualization Viewer (GLOVIS)
- http://glovis.usgs.gov/

Finding Free Imagery

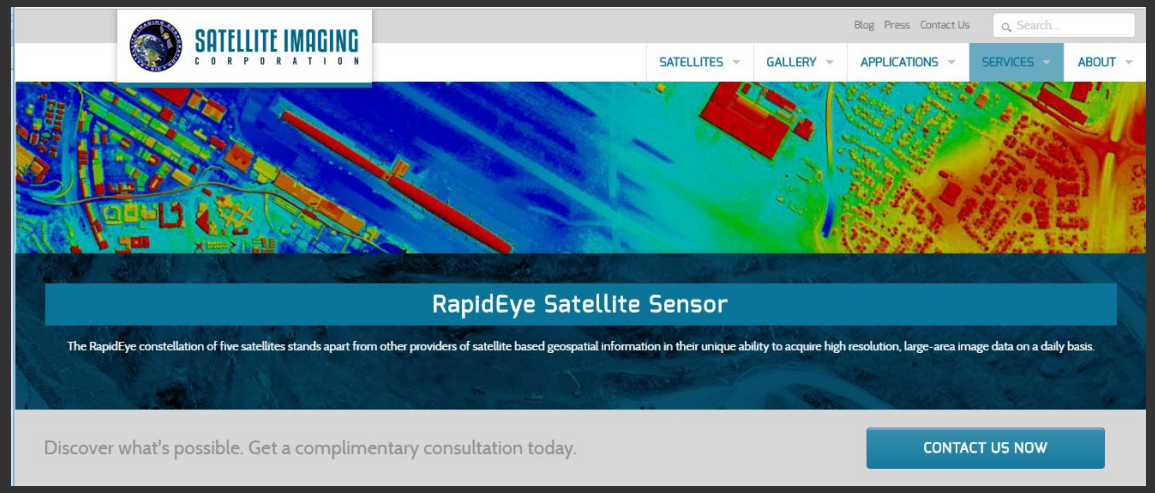


- ESA Copernicus
- https://cds.climate.copernicus.eu/#!/home
- https://scihub.copernicus.eu/

Buying Imagery

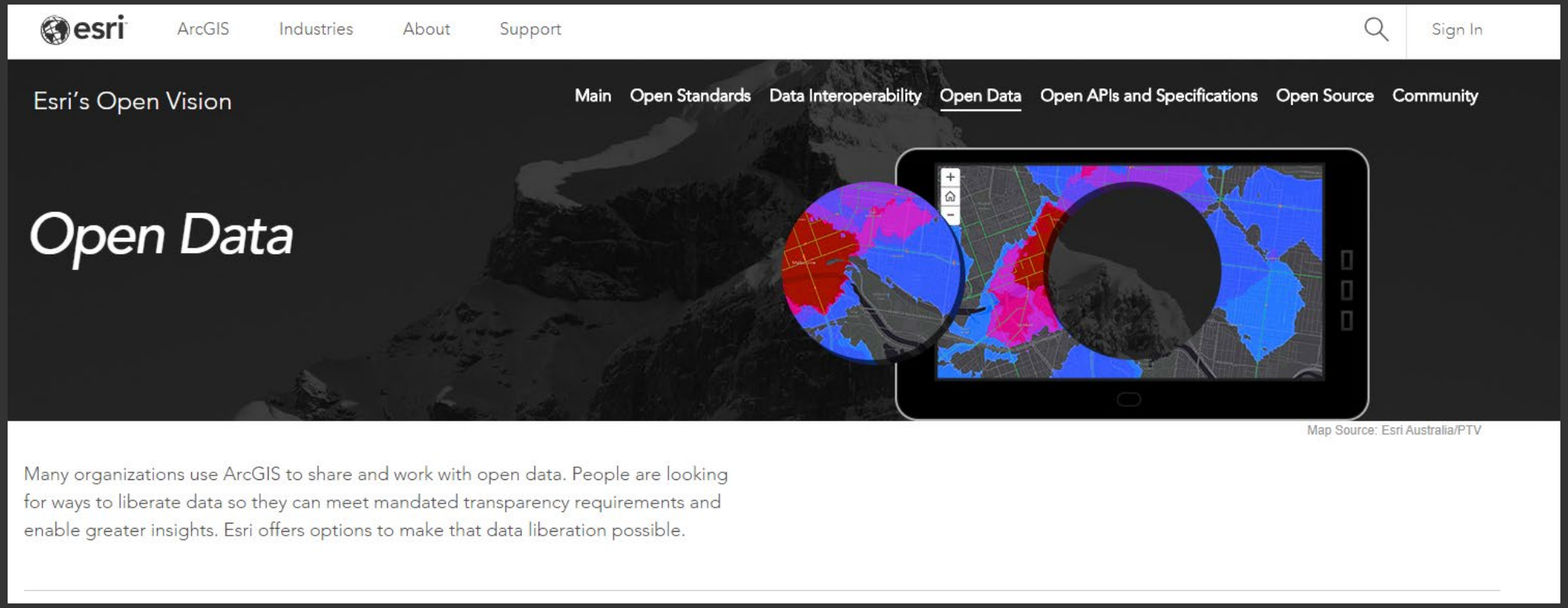


https://www.maxar.com/



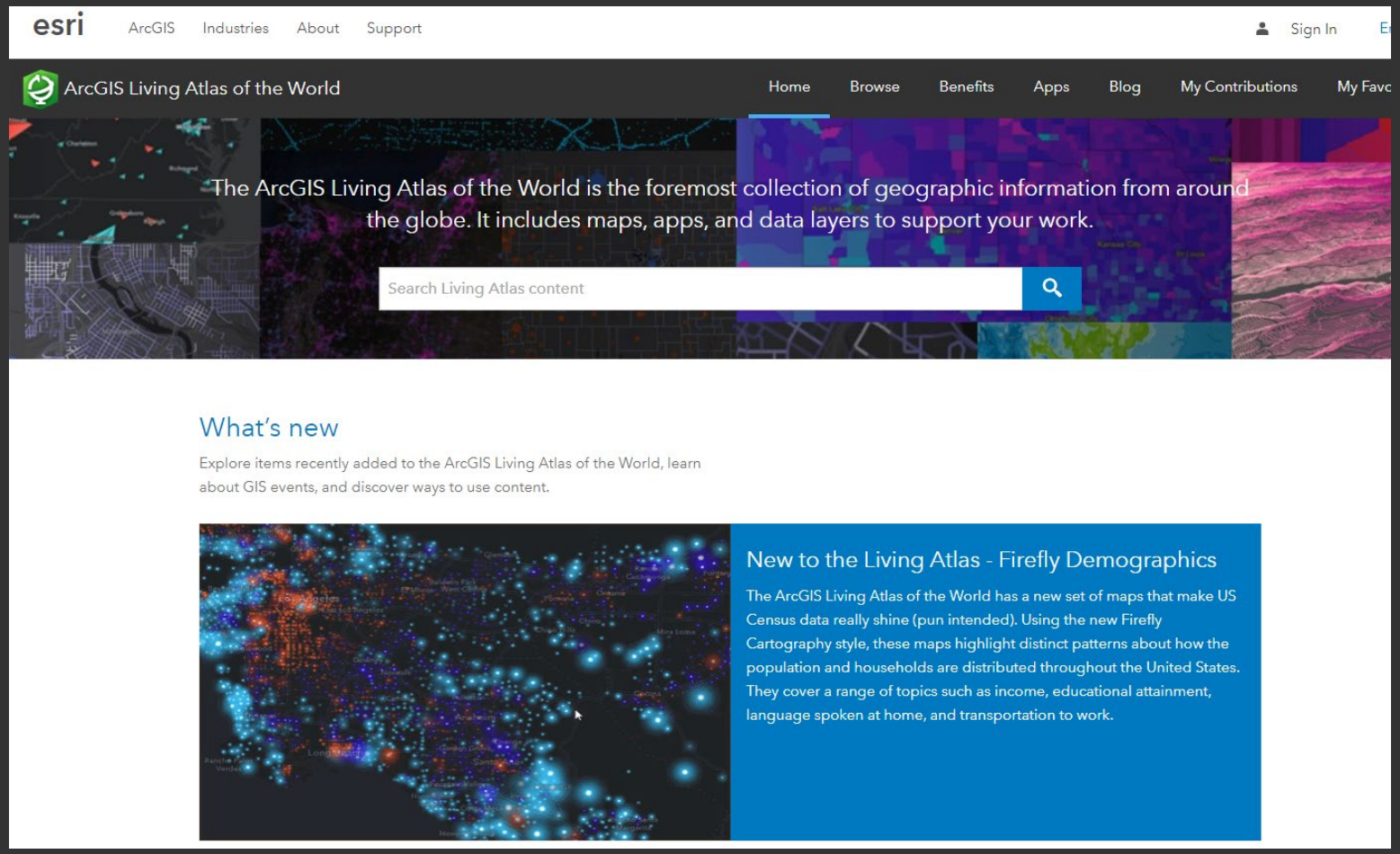
https://www.satimagingcorp.com/

ESRI Open Data



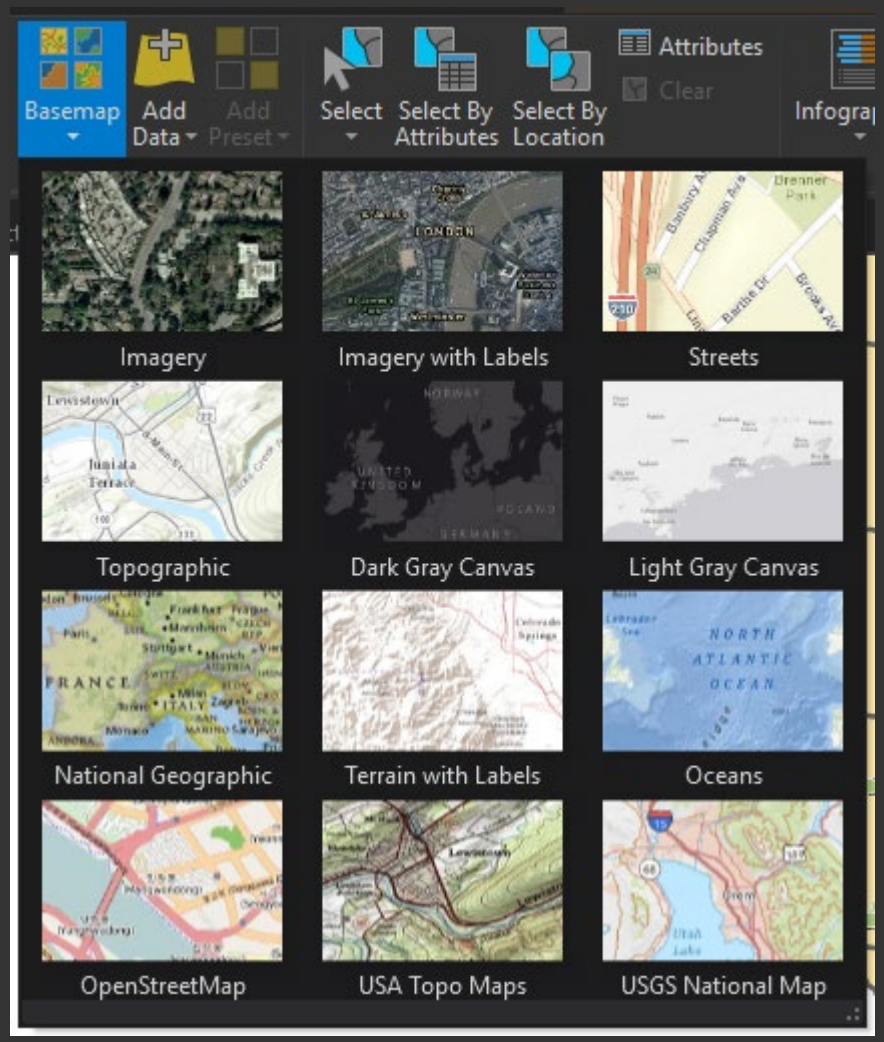
http://www.esri.com/software/open/open-data

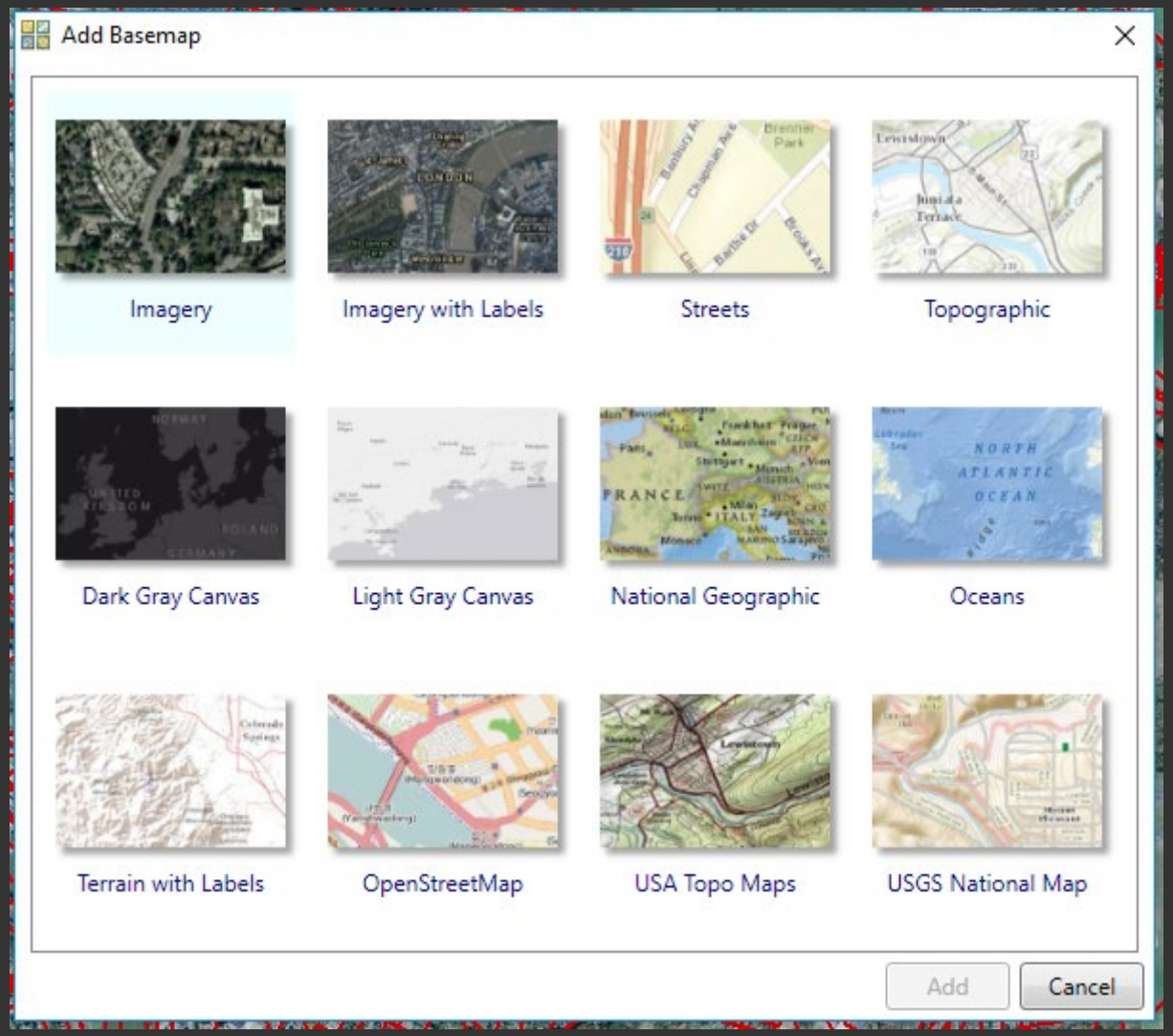
ArcGIS Living Atlas of the World



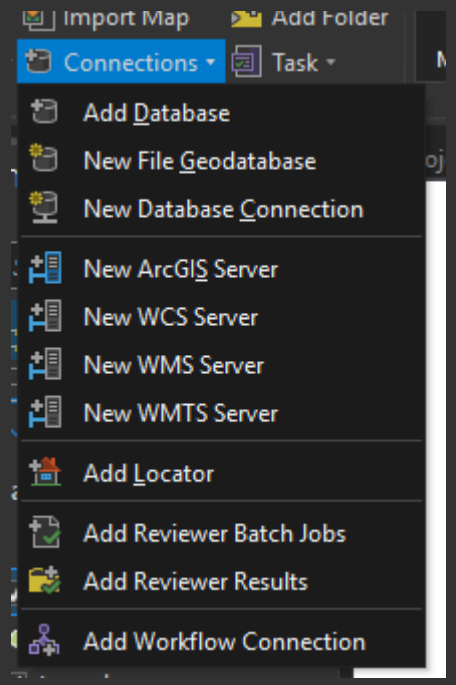
https://livingatlas.arcgis.com/en/

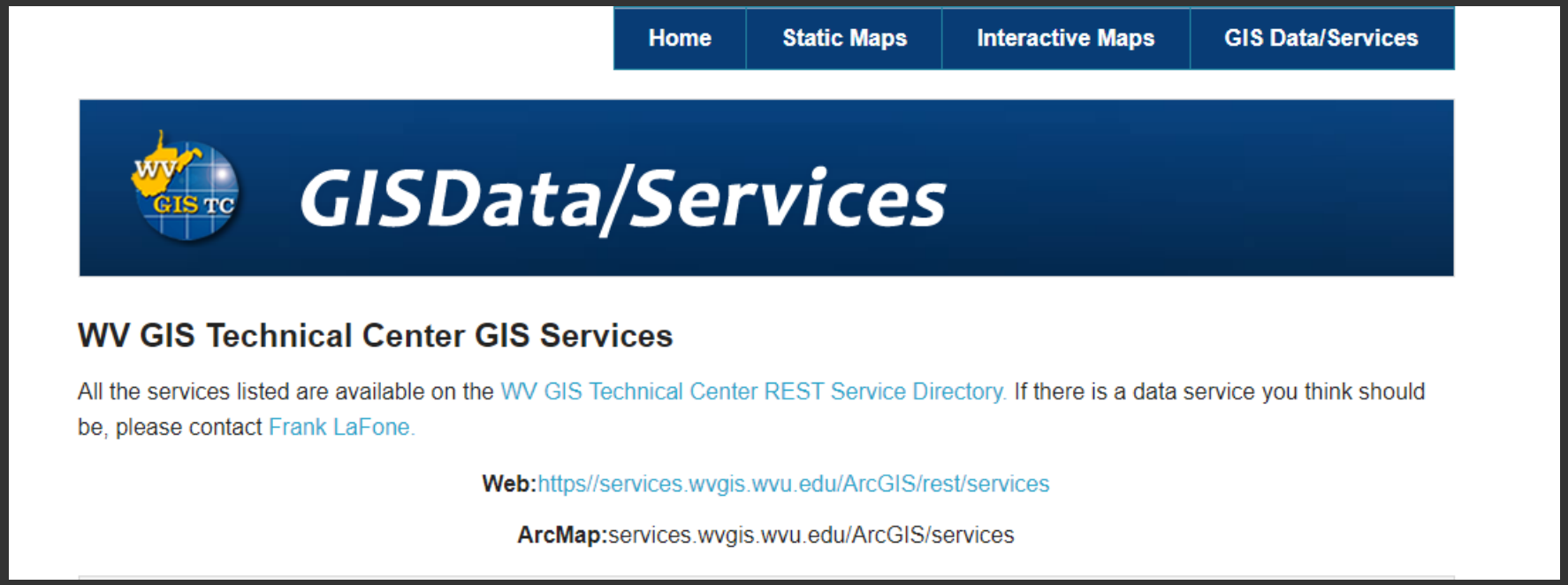
ArcGIS Basemaps





Connecting to Servers in ArcGIS Pro





https://www.mapwv.gov/gis_services.html

This is the end of this lecture module.

Please return to the West Virginia View Webpage for additional content.