



Geospatial Problem Solving

Example Data

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



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

This lecture provides an introduction to the example data used in the lecture modules.



Module Topics



1. Data used in the lecture modules

These are the topics covered in this module.

Example Data: ArcGIS Pro

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This section describes the example data used for the ArcGIS Pro exercises included in the lecture modules. The data can be downloaded from the course page on the West Virginia View website.

For the ArcGIS Pro exercises, the data have been partitioned into different maps within a single project file (exercises.aprx). The sources of the data layers included in each map are listed on the following slides.

Note that the exercises included in the lecture modules are optional. They are meant to provide additional, hands-on tasks to help reinforce the covered materials. The map used for each exercise is noted on the associated slide or slides.



- ❖ airports: <https://wvgis.wvu.edu/data/dataset.php?ID=115>
- ❖ libraries: <https://wvgis.wvu.edu/data/dataset.php?ID=174>
- ❖ summits: <https://wvgis.wvu.edu/data/dataset.php?ID=444>
- ❖ hospitals: <https://wvgis.wvu.edu/data/dataset.php?ID=500>
- ❖ higherEd: <https://wvgis.wvu.edu/data/dataset.php?ID=504>
- ❖ fireDept: <https://wvgis.wvu.edu/data/dataset.php?ID=499>
- ❖ emergencyMed: <https://wvgis.wvu.edu/data/dataset.php?ID=324>
- ❖ roadsCountyRoutes: <https://wvgis.wvu.edu/data/dataset.php?ID=284>
- ❖ roadsUSRoutes: <https://wvgis.wvu.edu/data/dataset.php?ID=284>
- ❖ roadsStateRoutes: <https://wvgis.wvu.edu/data/dataset.php?ID=284>
- ❖ trails: <https://wvgis.wvu.edu/data/dataset.php?ID=413>
- ❖ incorporatedPlaces: <https://wvgis.wvu.edu/data/dataset.php?ID=429>
- ❖ countiesWV: <https://wvgis.wvu.edu/data/dataset.php?ID=136>
- ❖ geology: <https://wvgis.wvu.edu/data/dataset.php?ID=43>
- ❖ wvLCsimple: <https://wvgis.wvu.edu/data/dataset.php?ID=489>
- ❖ wvDEM10m: 10 m spatial resolution digital elevation model derived from LiDAR
(<http://data.wvgis.wvu.edu/elevation/>)





us map



- ❖ **utmZones:** https://apps.gis.ucla.edu/geodata/dataset/world_utm_zones/resource/fc8af8e2-0818-4f50-bafo-2cc04cbaa541
- ❖ **states:** <https://www.census.gov/programs-surveys/geography.html>
- ❖ **statePlane:** <https://hub.arcgis.com/maps/23178a639bdc4d658816b3ea8ee6c3ae>
- ❖ **collegesUniversities:** <https://hifld-geoplatform.opendata.arcgis.com/datasets/colleges-and-universities/explore>

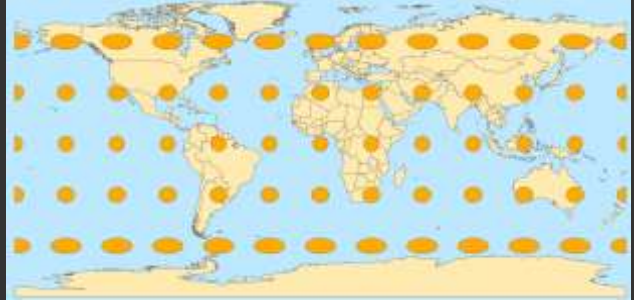




world map



- ❖ latLong15: <https://www.naturalearthdata.com/>
- ❖ latLong: <https://www.naturalearthdata.com/>
- ❖ tissotIndicatrix: <https://www.esri.com/arcgis-blog/products/product/mapping/tissots-indicatrix-helps-illustrate-map-projection-distortion/>
- ❖ countries: <https://www.naturalearthdata.com/>





vectorSymbology map



❖ **usDataAgg**: see
rawFiles/us_county_data_description.docx





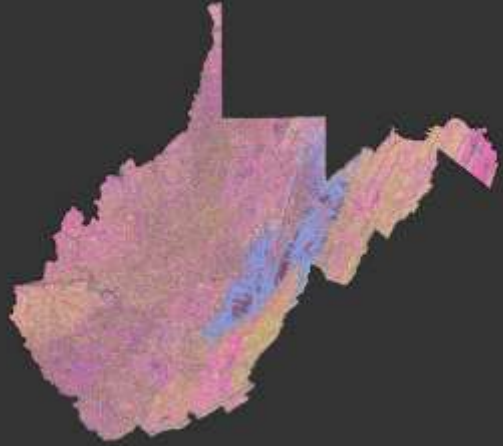
rasterSymbology map



❖wvLC:

<https://wvgis.wvu.edu/data/dataset.php?ID=489>

❖wvDEM10m: 10 m spatial resolution digital elevation model derived from LiDAR (<http://data.wvgis.wvu.edu/elevation/>)





germany map



❖ **germanyCities:**
<https://www.naturalearthdata.com/>

❖ **germanyRivers:**
<https://www.naturalearthdata.com/>

❖ **germanyStates:**
<https://www.naturalearthdata.com/>





❖ **fold**s:
<https://wvgis.wvu.edu/data/dataset.plp?ID=43>

❖ **fernowGeology**:
<https://wvgis.wvu.edu/data/dataset.plp?ID=43>

❖ **FernowBoundary**: USDA Forest Service Northern Research Station





❖europeanCountries:

<https://www.naturalearthdata.com/>

❖worldCountries:

<https://www.naturalearthdata.com/>





❖ **njNLCD2011**: 2011 National Land
Cover Database
(<https://www.mrlc.gov/>)





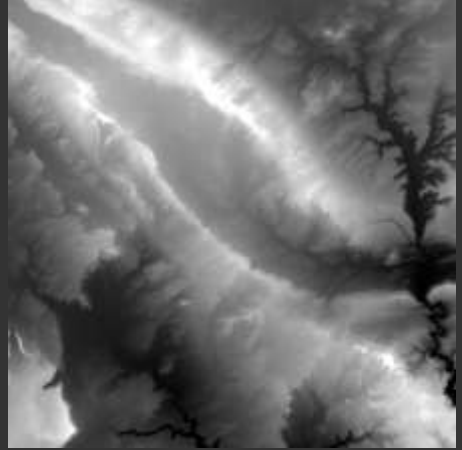
❖ **s2LeafOff**: Sentinel-2 image collected on November 29, 2020 (https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Sentinel-2).



Band	Included	Band Number in Stack	Native Spatial Resolution
Band 1 (Coastal Aerosol)	No	NA	60 m
Band 2 (Blue)	Yes	1	10 m
Band 3 (Green)	Yes	2	10 m
Band 4 (Red)	Yes	3	10 m
Band 5 (Red Edge 1)	Yes	4	20 m
Band 6 (Red Edge 2)	Yes	5	20 m
Band 7 (Red Edge 3)	Yes	6	20 m
Band 8 (NIR)	Yes	7	10 m
Band 8A (Narrow NIR)	Yes	8	10 m
Band 9 (Water Vapor)	No	NA	60 m
Band 10 (Cirrus Cloud)	No	NA	60 m
Band 11 (SWIR 1)	Yes	9	20 m
Band 12 (SWIR 2)	Yes	10	20 m

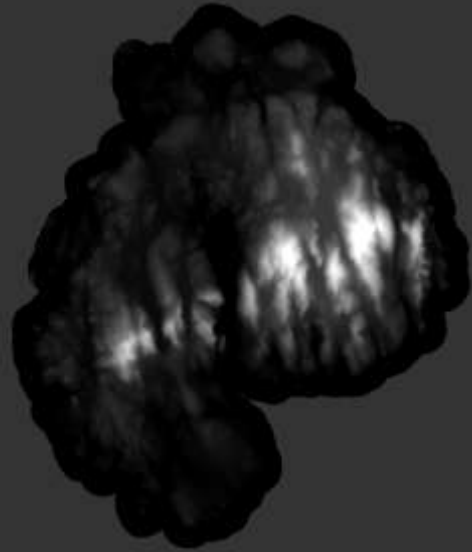


❖ **archeDEM**: 1 m DEM from
3DEP for Arches National Park,
Utah
([https://www.usgs.gov/3d-
elevation-program](https://www.usgs.gov/3d-elevation-program))





❖ **mdi**: 1 m DEM from 3DEP for Mount Desert Island, Maine (<https://www.usgs.gov/3d-elevation-program>)





❖venice2.jpg: <https://www.loc.gov/>





digitizing 1, digitizing 2, digitizing3 maps



❖ Drone imagery from OpenAerialMap:
<https://openaerialmap.org/>





vectorGeoprocessing map



- ❖ **airports:** <https://wvgis.wvu.edu/data/dataset.php?ID=115>
- ❖ **libraries:** <https://wvgis.wvu.edu/data/dataset.php?ID=174>
- ❖ **summits:** <https://wvgis.wvu.edu/data/dataset.php?ID=444>
- ❖ **hospitals:** <https://wvgis.wvu.edu/data/dataset.php?ID=500>
- ❖ **roadsStateRoutes:**
<https://wvgis.wvu.edu/data/dataset.php?ID=284>
- ❖ **trails:** <https://wvgis.wvu.edu/data/dataset.php?ID=413>
- ❖ **huc12WS:**
<https://wvgis.wvu.edu/data/dataset.php?ID=123>
- ❖ **incorporatedPlaces:**
<https://wvgis.wvu.edu/data/dataset.php?ID=429>
- ❖ **countiesWV:**
<https://wvgis.wvu.edu/data/dataset.php?ID=136>
- ❖ **geology:** <https://wvgis.wvu.edu/data/dataset.php?ID=43>





rasterSummarize map



- ❖ **samplePoints**: random points
- ❖ **ws**: <https://wvgis.wvu.edu/data/dataset.php?ID=123>
- ❖ **wvLCsimple**: <https://wvgis.wvu.edu/data/dataset.php?ID=489>
- ❖ **wvDEM10m**: 10 m spatial resolution digital elevation model derived from LiDAR (<http://data.wvgis.wvu.edu/elevation/>)
- ❖ **s2LeafOff**: Sentinel-2 image collected on November 29, 2020 (https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Sentinel-2).

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Band 10 (Cirrus Cloud)	No	NA	60 m
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vectorSummarize map



❖libraries:

<https://wvgis.wvu.edu/data/dataset.php?ID=174>

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❖countiesWV:

<https://wvgis.wvu.edu/data/dataset.php?ID=136>





❖ **motownEM:**

<https://wvgis.wvu.edu/data/dataset.php?ID=499>

❖ **motownFD:**

<https://wvgis.wvu.edu/data/dataset.php?ID=324>

❖ **addressesM.csv:** table of addresses to geocode





❖ **usDataAgg**: see
rawFiles/us_county_data_description.docx

❖ **collegesUniversities**:
<https://hifld-geoplatform.opendata.arcgis.com/datasets/colleges-and-universities/explore>





rasterOverlay map

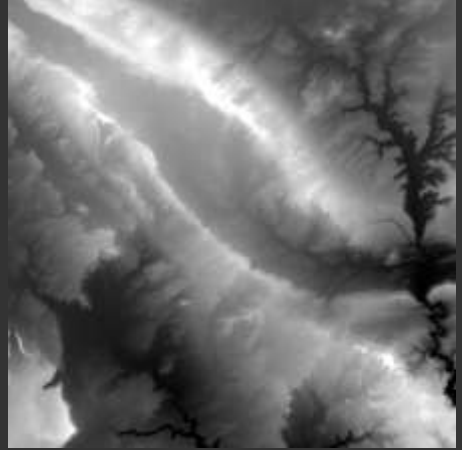


- ❖ **trails:**
<https://wvgis.wvu.edu/data/dataset.php?ID=413>
- ❖ **huc8WS:**
<https://wvgis.wvu.edu/data/dataset.php?ID=123>
- ❖ **geology:**
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❖ **archeDEM**: 1 m DEM from
3DEP for Arches National Park,
Utah
([https://www.usgs.gov/3d-
elevation-program](https://www.usgs.gov/3d-elevation-program))



Example Data: QGIS

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We have also provided data for experimentation inside of QGIS. The examples are provided as separate QGIS (.qgz) files. Vector data have generally been provided within GeoPackages while raster data have been provided at .tif or .img files.

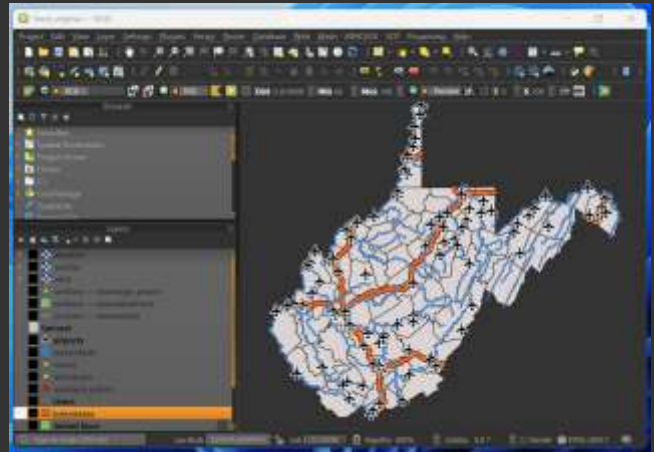
The following slides describe the provided data and their sources.



West Virginia Data



- ❖ west_virginia.qgz
- ❖ data → wvData.gpkg
- ❖ data → rasters → wvLC.tif
- ❖ data → rasters → wvElev.tif

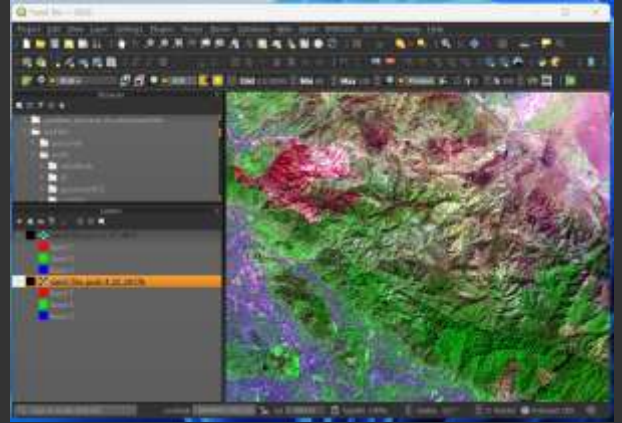




Sand Fire Data



- ❖ sand_fire.qgz
- ❖ data → burn → sand_fire_post_4_22_2017b.tif
- ❖ data → burn → sand_fire_pre_4_17_2015.tif

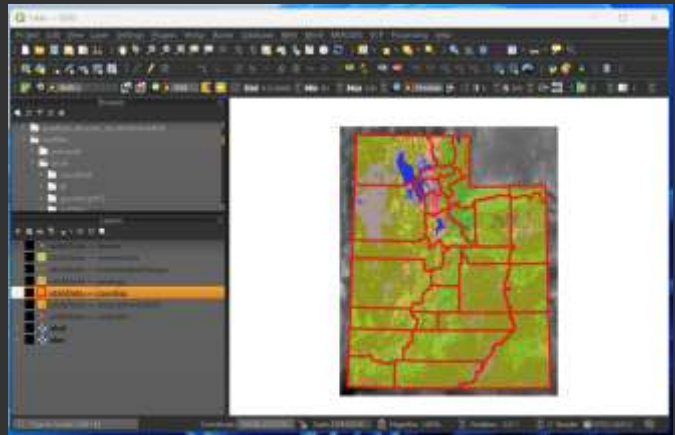




Utah Data



- ❖ Utah Data
- ❖ [utah.qgz](#)
- ❖ data → [utahData.gpkg](#)
- ❖ data → rasters → elev.tif
- ❖ data → rasters → nlcd.tif

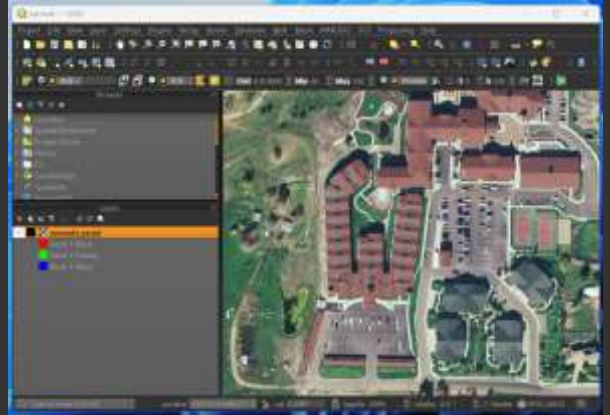




Zermatt Data



- ❖ `zermatt.qgz`
- ❖ `data → zermatt → zermatt_aerial.tif`
- ❖ `data → zermatt → zermatt_map_georef.png`
- ❖ `data → zermatt → Zermatt-Utah-Property-Map.pdf`
- ❖ `data → zermatt → dems`





This is the end of this lecture module.

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



Thanks! Hope you found this useful.