Written by Raechel Portelli
2015 updated October 2021

Forms of Geographic Data

Learning Objectives

1. Identify sources of geographic data.
2. Download data using common geospatial data portals.
3. Import GeoJSON data and convert it to a shapefile.

Types of Geospatial Data

Geographic Information is stored in vector and raster models. There are numerous formats for storage. The common vector format is the ESRI shapefile. Similarly, the .GeoTIFF format is commonly used for rasters. Even though these are common formats, there are others as well. Knowing how to access these formats and bring them into a GIS is crucial for cartographic practices. In this lab you will learn about three popular geospatial data resources.

Data Portals

The most common way to acquire data for GIS applications is the use of online web portals. Almost every state, county, and city in the United States have created clearinghouses for the distribution of geographic data. In many cases you can even acquire these data from using map-based applications.

USGS National Map Viewer [https://apps.nationalmap.gov/downloader/#/]

The USGS National Map Viewer tool provides many vector based geographic data. The data available here is the same data used to create the USGS topographical reference maps that you may be familiar with.

1. First, navigate to the National Map Viewer.
2. Next, zoom into your hometown. Continue to zoom until the scale bar in the lower left hand corner of the map is 1 inch to 1 mile. Create a screen capture of your map.

3. Create a polygon on the map using the polygon tool. This will refine the extent of the data you download.
4. Download a data layer.
   a. To do this, you should click on the "Download Data" Link on the upper right hand corner above the map. You are given several download options in a menu. <u>What are the two file formats that you have to choose from?</u>
5. Once you click next you will be taken back to the web portal. You can check out by entering your email address in the left hand menu.
6. Once you have received the email with the data, you should download it and unzip it. You will then need to open the file in ArcMap. <u>Create a screen capture of the data displayed in ArcMap.</u>

USGS Earth Explorer
https://earthexplorer.usgs.gov/

The USGS Earth Explorer <u>portal</u> is one of the most useful places for gathering geospatial data about the United States. The basic steps for acquiring data through this web portal are to identify your location of interest, set the date range that you are interested in, determine the data sets fit your needs, and then filter the results. You can then login and download or order the data you request.

1. Navigate to Earth Explorer.
2. Under Search Criteria, input New York, NY the address bar. Click on the link that results. You will see a point marker pop up on the map.
3. Set the date range for your search. You should use June 1, 2020 as the start date and August 31, 2021 as the end date.
4. Click on the "Data Sets" button at the bottom of the window.
5. Scroll through the list of data sets available. Navigate to the Landsat Archive.
6. Now, look at the footprint of one of the images.
7. Next, <u>preview the Landsat image and create a screen capture of this preview image.</u>
8. <u>Download the LandsatLook image for your hometown and open it in ArcPro.</u>

Written by Raechel Portelli
2015 updated October 2021

Beyond Shapefiles

**This section is currently not working due to server issues. It is still an important tool to be aware of. In order to complete the import of GeoJSON to ArcPro please skip ahead to the Geojson.io section.

The ESRI shapefile is a very common format for storing geospatial data in vector format. Other methods of storing vector data also exist and can be used in ArcPro. The geoJSON format is data interchange format based on JavaScript Object Notation (JSON). It's specification can be found here if you are interested. This format has become much more common as a data format with the surge in web mapping and it can easily be imported into ArcPro.

Open Street Map (OSM) is one place where you can obtain reference data for anywhere around the globe. Next, you will learn how to export this data and convert it to GeoJSON.

1. Open OSM and navigate to your hometown. Create a boundary around the town. <u>Create a screenshot of the boundary map.</u>
2. Use the Overpass API to export your data as a file called map in an XML-formatted data.
3. Open the map file with the MyGeoData.cloud to convert it to a GeoJSON format.
4. Next add the OSM GeoJSON file in ArcPro. Use the "JSON to Features" tool. You can access the tool quickly using the toolbox search bar.

GEOJSON.io

Being flexible and knowing the digital tool landscape is imperative for being successful in any technical trade. GIS is no exception. Unfortunately, that landscape changes at the speed of light and tools are constantly emerging and others are becoming obsolete. For this section, you will try your hand at creating your own GeoJson file and displaying it in ArcPro.

1. Navigate to GeoJson.io in your web browser. You should see a Mapbox map and a codebox on the right.
2. In the map interface navigate to your hometown, or your favorite town.

3. Create a GeoJson of the major street, or main street for that town. To do this there are tools in the upper right hand corner of the map. To end a line, double-click.
    a. You should see the code box populated with the geojson data after you complete each feature.
4. Once you've completed the digitization, export your GeoJson using the Save menu in the upper left-hand corner.
5. Next add the OSM GeoJSON file in ArcPro. Use the "JSON to Features" tool. You can access the tool quickly using the toolbox search bar.
    a. Make sure when you use this tool that the proper Geometry Type is selected. For roads, you are likely using Polylines. If you do not select the proper type you may encounter errors.
6. Screen capture your road on top of one of the ArcPro basemaps and submit it as a pdf.