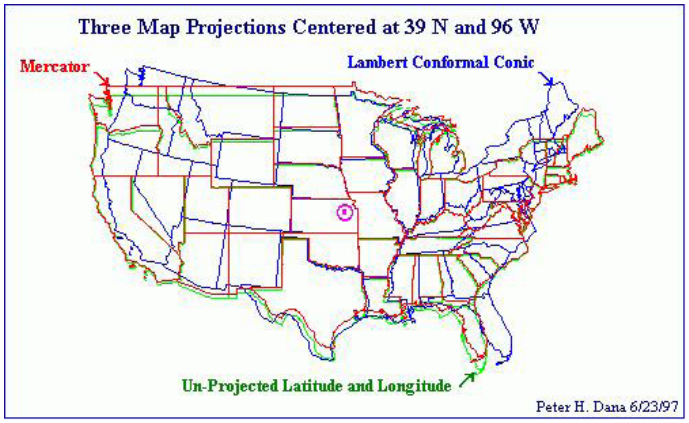
QGIS 2.18.7

QGIS: Projections & Enabling on the Fly Projection

Welcome to the Essential ArcGIS Task Sheet Series. This series supplements the Iowa State University GIS Geospatial Technology Training Program short course series, "Essential ArcGIS Tutorial Series." The task sheets are designed to provide quick, easy instructions for performing specific tasks in GIS.

A projection is a way to translate the curved surface of the earth (3D) onto a flat map (2D). The challenge is that every map projection has distortion because the spherical nature of the globe cannot be perfectly represented in a two dimensional map. The picture below illustrates similarities and differences of three map projections. This image powerfully demonstrates the importance of defining the projection. For example, if you were working with data in Washington State you may have very different results working in Mercator or Lambert Conformal Conic. Knowing the projection of your data is important especially when working with data that is part of a dataset that is larger than just your county or state. This tasksheet will cover how to change the projection of an existing file as well as enabling on the fly projection in QGIS.

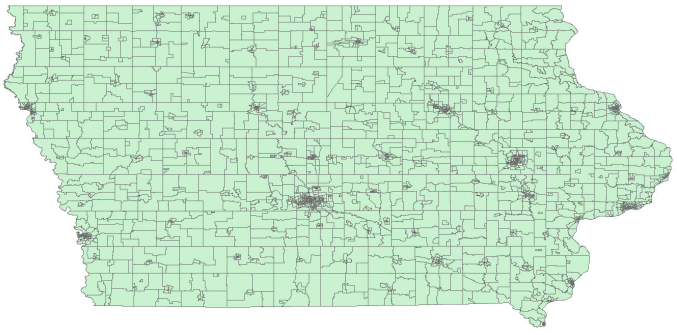
1. Download the Data



a. Download the data used in this task sheet by navigating to http://isueogtp.github.io/GISTaskSheets/TaskSheetData/PM2082-14j.zip in a web browser. The files you for this tutorial will automatically be downloaded.

b. When the download is complete, you will need to unzip the folder or copy the files from the zipped folder to a different directory in order to access the files.

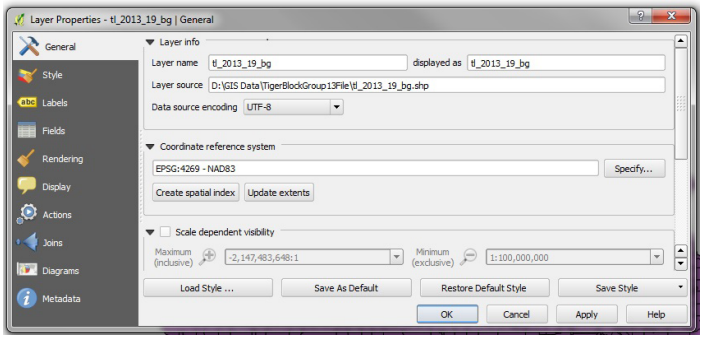
2. Change the Projection of an Existing File



a. In this example we will be taking a shapefile from the US Census Bureau which is projected in NAD 83, a general projection for North America, and giving it a more specific projection for Iowa, NAD 83/UTM zone 15N.

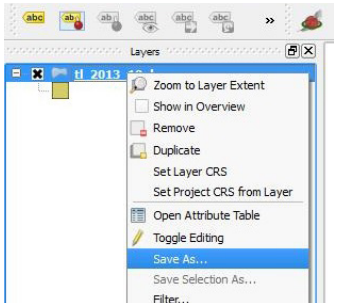
b. Open QGIS and add the **tl_2013_19_bg.shp** from **Step 1a** and **Step1b**.

c. Right-click on **tl_2013_19_bg** in the **Layers Panel**, select **Properties** to open the **Layer Properties** window.



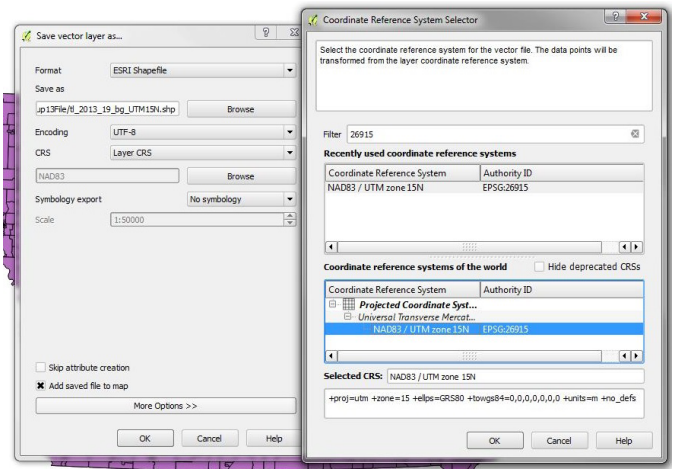
d. View the **General** tab. Here you will see information about the shapefile's projection. Under **Coordinate Reference System** (CRS) you should see **ESPG: 4269 – NAD 83**. Since we will be working with only Iowa data we want to change the projection to better represent Iowa. Click **OK**. *Note: a CRS is used to define the projection ellipsoid and datum (NAD-83 UTM ZONE 15), the necessary information for drawing layers.*

e. Right-click on **tl_2013_19_bg** in the **Layers Panel**. Select **Save as...**.



f. In the **Save vector layer as…** window choose the following options:

- **Format**: **ESRI Shapefile**
- **File name**: Choose **Browse** and save the file in the same folder as the original shapefile, but name it **tl_2013_19_bg_UTM15N.shp**.
- **CRS**: Click the **Select CRS** icon, type **26915** into the **Filter** box then select **NAD 83/UTM zone 15N** to highlight it then click **OK**.
- Check the box next to **Add saved file to map**.
- Leave all other default settings and click **OK**.



g. The file will be added to the map, and will have the newly defined projection.

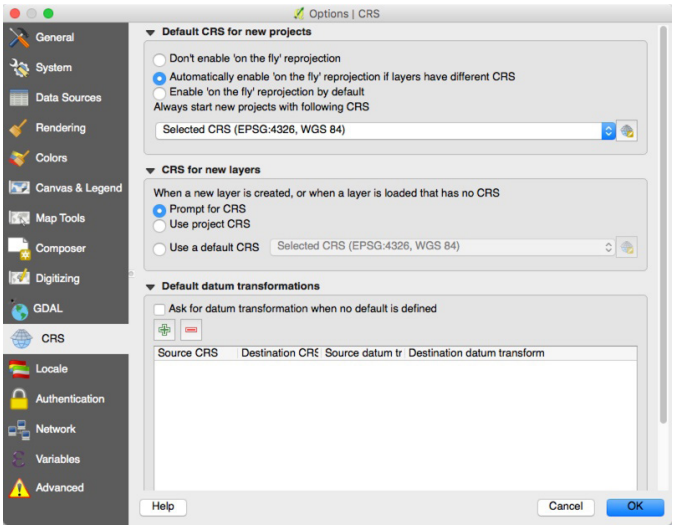
3. Enable on the Fly Projection

a. On the fly projection should automatically re-project files to your preferred projection so you can work with them in your viewer without changing the underlying projection of the file. *Note: When you install QGIS "enable on the fly projection" must be established.*

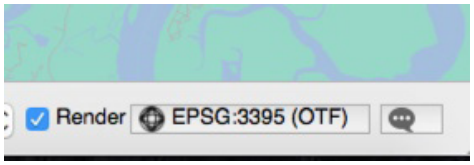
b. Click on **Settings** in the menu bar and select **Options**. In the **Options** window, select the **CRS** tab.

c. Under **Default CRS for new projects** section make sure **Automatically enable 'on the fly' reprojection if layers have different CRS** is selected, and choose your preferred CRS from the drop-down menu. *Hint: If the data you work with is always just for Iowa you may want to select EPSG:26915 - NAD83/UTM zone 15N.*

d. Under **CRS for new layers** section **Use default CRS displayed below** if you'd like all your new layers to be created with the same CRS, otherwise, select **Prompt for CRS** to be asked each time. Click **OK** to close the window.



e. To verify the projection QGIS is using for your project look in the bottom right corner of the QGIS window, the CRS that is being used is listed there.



Contact:

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