

5-2014

# QGIS: Projections & Enabling on the Fly Projection

Amy A. Logan

*Iowa State University*, amylogan@iastate.edu

Bailey A. Hanson

*Iowa State University*, bahanson@iastate.edu

Christopher J. Seeger

*Iowa State University*, cjseeger@iastate.edu

Follow this and additional works at: [http://lib.dr.iastate.edu/extension\\_pubs](http://lib.dr.iastate.edu/extension_pubs)

 Part of the [Architectural Technology Commons](#), [Landscape Architecture Commons](#), [Other Architecture Commons](#), and the [Urban, Community and Regional Planning Commons](#)

---

## Recommended Citation

Logan, Amy A.; Hanson, Bailey A.; and Seeger, Christopher J., "QGIS: Projections & Enabling on the Fly Projection" (2014).  
*Extension and Outreach Publications*. 152.

[http://lib.dr.iastate.edu/extension\\_pubs/152](http://lib.dr.iastate.edu/extension_pubs/152)

**Iowa State University Extension and Outreach publications in the Iowa State University Digital Repository are made available for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current publications and information from Iowa State University Extension and Outreach, please visit <http://www.extension.iastate.edu>.**

## QGIS: Projections & Enabling on the Fly Projection

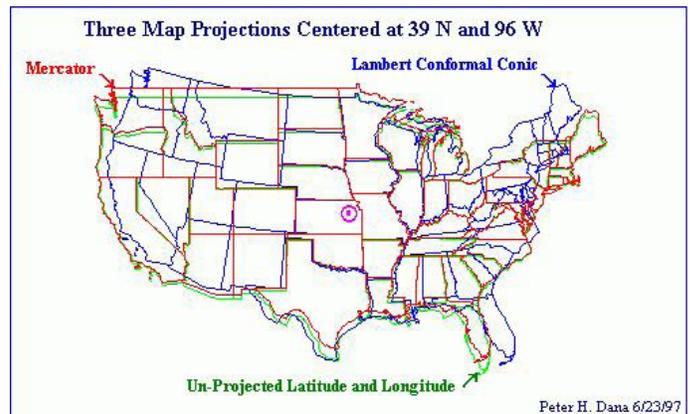
QGIS 2.2

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. If you are interested in further discussion on projections check out the National Map website: [http://www.nationalatlas.gov/articles/mapping/a\\_projections.html](http://www.nationalatlas.gov/articles/mapping/a_projections.html). 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 task sheet will cover how to change the projection of an existing file as well as enabling on the fly projection in QGIS.

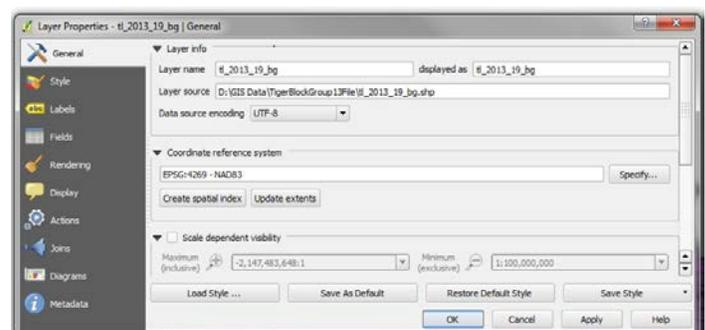
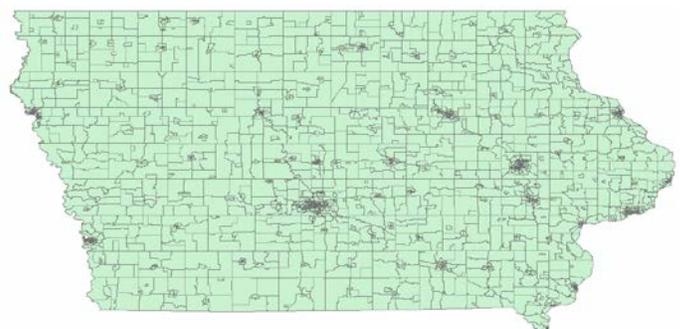
### 1. Download the Data

- To download the data used in this task sheet, navigate to [www.extension.iastate.edu/communities/gis/quicktasksheets/data](http://www.extension.iastate.edu/communities/gis/quicktasksheets/data) in a web browser. Click on the publication number that matches this task sheet. In this case, the publication number is **PM2082-14j**. *Note: the publication number can be found on the bottom right-hand corner of the second page of this task sheet.*
- When the download is complete, you will need to unzip the folder or copy the files from the zipped folder to a different folder or directory in order to access the files.



### 2. Change the Projection of an Existing File

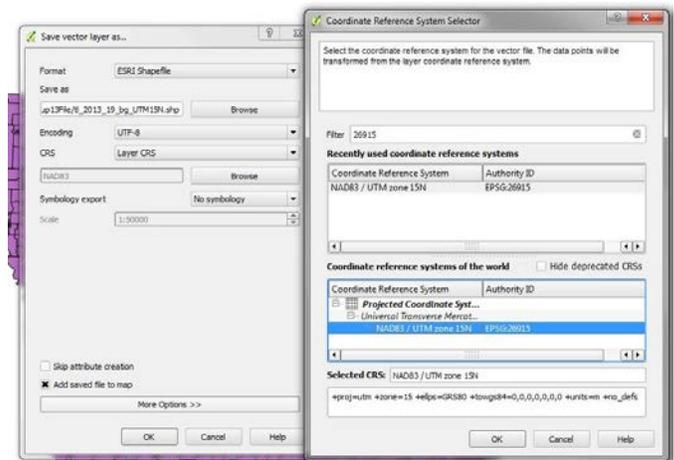
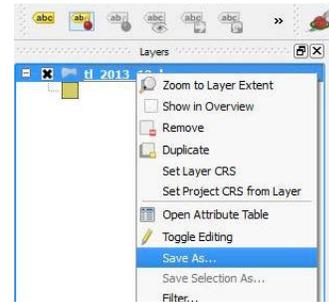
- In this example we will be taking a shapefile from the US Census Bureau which is projected in NAD 83, a general projection for North America, and giving it a more specific projection for Iowa, NAD 83/UTM zone 15N.
- Open QGIS and add the **tl\_2013\_19\_bg.shp** from Step 1a and 1b.
- Right-click on **tl\_2013\_19\_bg** in the **Layers** tray, scroll down to **Properties**. The **Layer Properties** window will open.
- 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 a *Coordinate Reference System*; QGIS uses this information to define the projection ellipsoid and datum (NAD-83 UTM ZONE 15), the necessary information for placing and drawing the images.

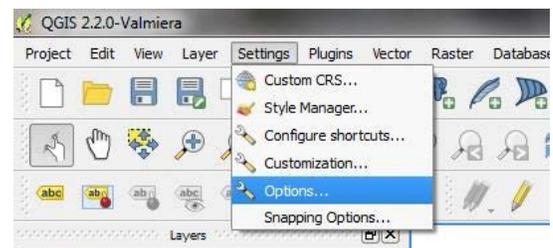
- e. Right-click on **tl\_2013\_19\_bg** in the **Layers** tray. Select **Save as...**.
- f. In the **Save vector layer as...** window choose the following options:

- **Format: ESRI Shapefile**
- **Save as:** Choose **Browse** and save the file in the same folder as the original shapefile. Name this file: **tl\_2013\_19\_bg\_UTM15N.shp**.
- Leave default for Encoding.
- **CRS:** Choose **Browse** and type **26915** into the **Filter** box then choose **NAD 83/UTM zone 15N** and highlight it in blue in the second box. Click **OK**.
- Skip down to **Add saved file to map**, check the box and click **OK**.



### 3. Enable on the Fly Projection

- a. On the fly projection in Quantum GIS 2.2 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 main toolbar and select **Options**. In the **Options** window, select the **CRS** tab.
- c. Click on the **Select** button in the **Default Coordinate Reference System for new projects** section. This will bring up the **Coordinate Reference Systems Selector** box.
- d. In the **Filter** box, type in **26915**, then look in the box below and choose **NAD83 / UTM zone 15 N**, click **OK**.
- e. You should see **EPSG:26915 - NAD83 / UTM zone 15N** in the box next to the **Select** button.



- f. Check the box **Enable 'on the fly' reprojection by default**.
- g. In the **Coordinate Reference System for new layers** section click the **Select** button. Repeat Steps 3e - 3f
- h. Click on the button **Use default CRS displayed below** and press **OK**.
- i. Close QGIS and restart the program. Add **tl\_2013\_19\_bg.shp** back into the program. If enabling on the fly projections was done correctly you should see a EPSG:26915 in the right hand corner of the screen.

### Contact:

Amy Logan amylogan@iastate.edu, 515 294 0980 for QGIS specific questions. Bailey Hanson bahanson@iastate.edu, 515-520-1436 or Professor Christopher J. Seeger, ASLA, GISP cjseeger@iastate.edu, 515-509-0651 for more information about the Geospatial Technology Program. This task sheet and more are available at [www.extension.iastate.edu/communities/gis](http://www.extension.iastate.edu/communities/gis)

...and justice for all  
The US Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue SW, Washington, DC 20250-9410, or call 800-795-3272 (voice) or 202-720-6382 (TDD).

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the US Department of Agriculture. Cathann Kress, director, Cooperative Extension Service, Iowa State University of Science and Technology, Ames, Iowa.