

Chapter 7

Working with Projections in ArcGIS Desktop (ArcMap)

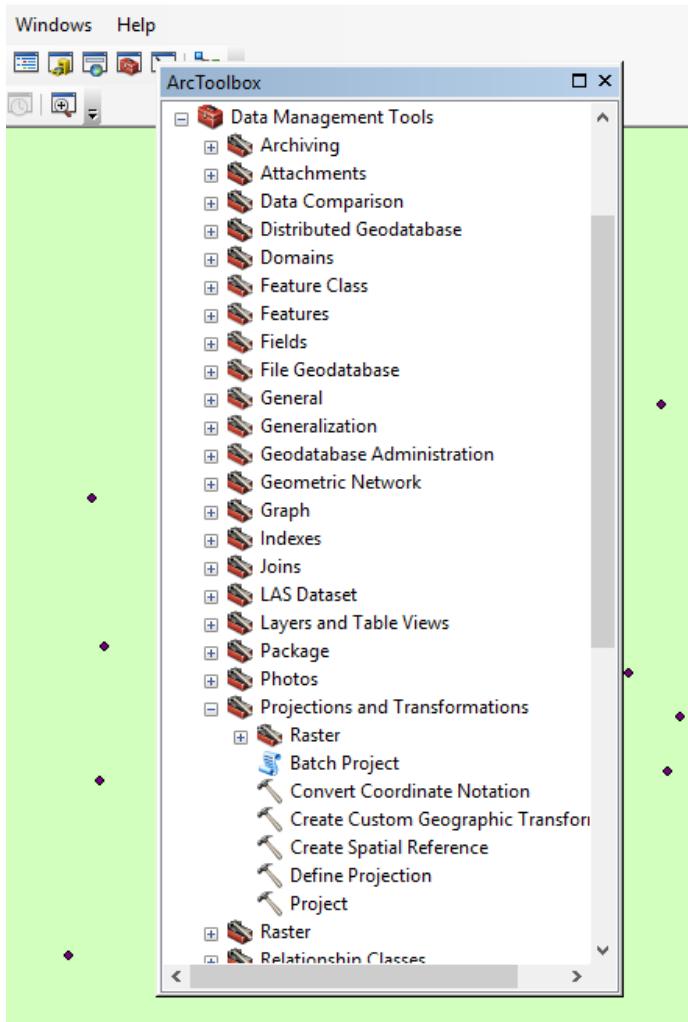
Skills you will learn: There are two tasks you may need to perform with projections. The first is to project a map that has no projection (i.e. has only a geographic coordinate system), the other is to define the projection of a map that is supposed to be projected, but is missing the information.

Projecting a map

In this first part of the tutorial, we'll add a projection to a point map of locations of polluting facilities in Canada, derived from a downloaded set of locations available at <http://open.canada.ca/data/en/dataset/40e01423-7728-429c-ac9d-2954385ccdfb>.

The map uses the NAD83 datum, but is not projected.

We'll add an appropriate projection to the map. To do so, we'll use the **project** tool, which is found in the Arc toolbox. Click on the Arc Toolbox icon, then navigate to Data Management Tools>Projections and Transformations>Project.



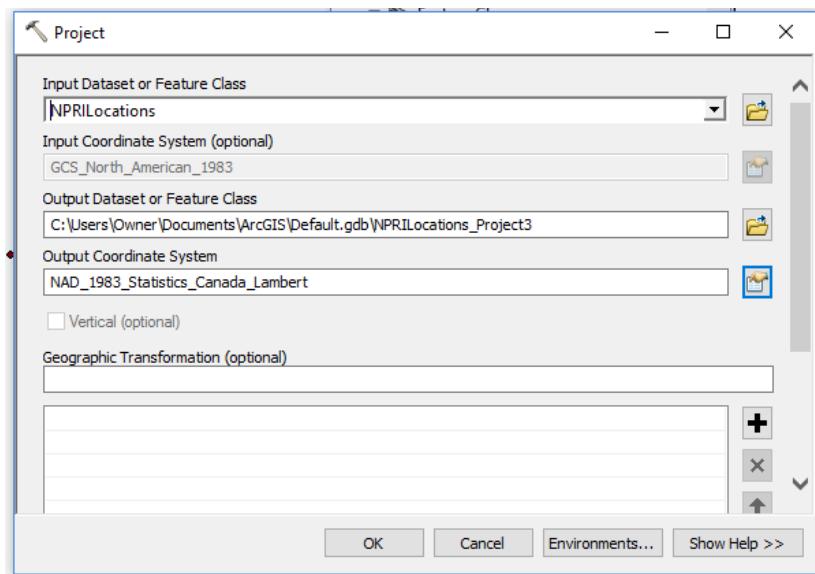
Double click on the Project icon. This opens the project dialogue.

In the Input Dataset or Feature Class window, either choose the dropdown list of available layers open in the map document, or navigate to the folder containing the input shapefile or feature class.

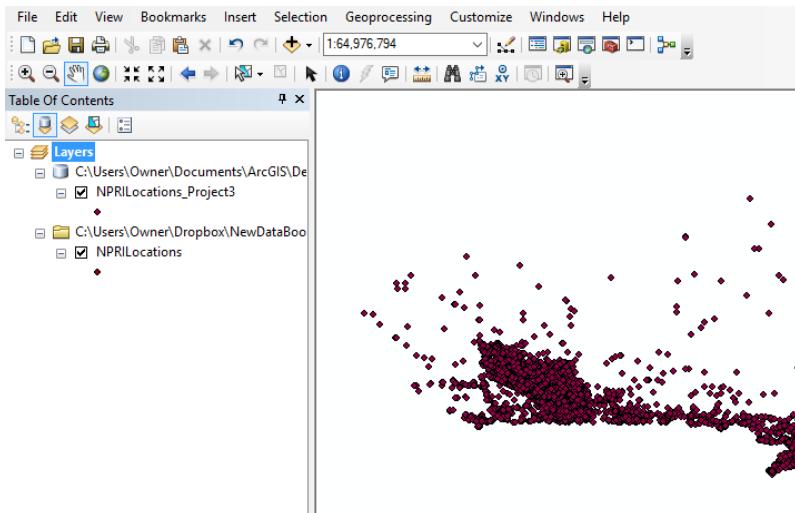
In the output window, click on the file folder to navigate to the folder where you will save a shapefile, or the file geodatabase where you will save a feature class.

In the output coordinate system area, click on the icon to see lists of available projected coordinate systems. Choose an appropriate coordinate system for your area and the underlying datum of your map. If the projection is based on a different datum, you will need to choose a datum transformation method to avoid alignment issues with your new layer.

In this case, we will project the map to the Statistics Canada Lambert Conformic projection, which is a good projection for Canada, with its wide east-west extent.



Click OK and ArcGIS will project the layer. If background geoprocessing is disabled, you will see a progress box. Otherwise, you will see a notification in the system tray. The new, projected layer will be added to the post.



Define projection

If you have a shapefile that is intended to be projected but is missing its .prj file (see Chapters 6 and 7 of *The Data Journalist* for a discussion of projections and the file structure of a shapefile), use the define projection tool.

You will need to find out what the projection for the map is intended to be, either from the layer's metadata, or if necessary, from the keepers of the data.

Once you know, click on Data Management Tools>Projections and Transformations>Define Projection. In the dialogue that opens choose the input feature class or shapefile, then choose the projection to be added. Click OK and the projection will be added to the existing layer.