Converting latitude-longitude to northing and easting in ArcGIS

If you have data points with coordinates in latitude and longitude, then you can transform these into northing and easting, into any projected local coordinate system. Let's say we have a table with coordinates in degrees minutes and seconds and the data are from somewhere in Halle, Germany. What we want to do is to transform them into Germany Zone 4 northing and easting coordinate.

1. First convert the degrees minutes seconds into decimal degrees.

Decimal degrees = Degree + (minutes/60) + (seconds/3600).

So 11°49'31.64" will be = 11 + 49/60 + 31.64/3600 = 11.8254555 in decimal degrees approximately.

Approximately, because you can take as many digits after decimal point as you need for precision. It can be even 20 digits after decimal points. There are many sites that offer such conversion. But for plenty of data and to have more digits after decimal points, it's better to use Excel table.

Now let's say you have your Excel table in decimal degrees for latitude and longitude. **Note that** in your Excel table keep the first row for field names like latitude and longitude. For easiness, it's better to have the first column for longitude, and the second column for latitude.

2. Now save the Excel file in dbf format. Highlight the range of the cells or just put your cursor in any of the cells containing data, go to save as and save the file as DBF 4 (dBASE IV) (*.dbf) type. It's compatible with ArcGIS.

3. Open ArcMap. You will add the table you just saved as dbf file (e.g. sample.dbf) to ArcMap now.

4. You can do it either using the 'Add Data' icon from the toolbar, or from the menu bar > Tool > Add XYData.

5. The Add XY data window will open. Browse for your file. Then specify Longitude in the X-Field and Latitude in the Y-Field.

6. It's always **good to choose a spatial reference for your data points**. In the same Add XY Data window, under 'Coordinate System of Input Coordinates' click Edit > Select > Geographic Coordinate Systems > World > here select "WGS 1984.prj". Click Add. Now click OK to close the Spatial Reference Properties dialog. Click OK to close the Add XY Data window. Now your locations are added to ArcMap.

7. Now click anywhere in the Data Frame where your points are appeared. Right click on your mouse and select Data Frame Properties. The Data Frame Properties window will open.

8. In the Data Frame Properties, click on the General tab. From Units choose Meters. Now click on the Coordinate System tab. You will see in the 'Current coordinate system:', GCS_WGS_1984 is selected. Nothing to do here.

In the 'Select a coordinate system:', you will select the local projected coordinate system. Click Predefined > Projected Coordinate Systems > National Grids > Germany Zone 4 Grid.

Don't close the window because here you will transform your current coordinate system WGS 1984 to the projected coordinate system of Germany Zone 4.

Click on Transformations button. The Geographic Coordinate System Transformations window will open. If you don't need to modify anything here, then click OK to close the window. Click OK to close the Data Frame Properties dialog.

Now you will have the transformed coordinates in your ArcMap which is here Germany Zone 4. Look at the status bar down, you will see the changes in your coordinate system which is now in meters.

But you haven't finished yet.

9. Right click your sample Events layer > Data > Export Data. Export Data window will open.

Under 'Use the same coordinate system as:' choose 'the data frame'. And in the 'Output shapefile or feature class:' browse to your folder where you would like to save your shape file. You can also change the shapefile name to your favorite one (by default it's Export_Output.shp). Click OK to close the dialog. Say 'Yes' when it asks you to add the exported data to ArcMap as layer. Now it's better to remove your earlier sample event layer to keep things clean.

10. However, if you now right click on your Export_Output layer and open the attribute table, you will find that the table is still showing decimal degrees. You need to change it to the current data frame coordinate system, which is in our case Germany Zone 4.

11. Open your ArcToolbox either by clicking on the red arctoolbox icon from toolbar or from the Window menu from the menubar.

12. In ArcToolbox > Data Management Tools > Features > 'Add XY Coordinates' tool. The Add XY Coordinates tool window will open.

13. In the Input Features, select your Export_Output layer. Click OK to start the process. When everything is fine, then it will show you a small window giving you the information that it's completed now. Click Close to close the window.

14. Now if you right click on your Export_Output layer to open the attribute table, you will see the newly added data locations in your projected coordinate system under the field names POINT_X and POINT_Y. You are done!!!

However, there's another way to get the data locations in your projected coordinate system.

Right click on your Export_Output layer to open the attribute table. Right click the field name that contains your Long > Calculate Geometry… > Say 'Yes' to accept the warning. Calculate Geometry window will open.

In the Property choose X Coordinate of Point from the dropdown menu,

In the Coordinate System select 'Use coordinate system of the data frame'.

Units should be in Meters. Click OK. Do the same to get your latitude values as well.

Now that you are done, so put a smile on your face ☺.

Note: You can convert your degrees minutes and seconds into decimal degrees here: conversion

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www.shamskm.com