

Importing XY (Point) Data from MS Excel to ArcMap

These instructions enable you to bring in XY coordinates (in decimal degrees) into an ArcMap document using MS Excel and ArcGIS 8.1 software. The following outlines the steps in this instruction set:

- Import a text delimited table of Longitude and Latitude locations in the format DMS (degrees/minutes/seconds) into MS Excel
- Calculate DD (decimal degrees) and save as a dBase table
- Import dBase table of XY data into ArcMap
- Optionally, change the coordinate system/projection
- Save as a shapefile

This is what you need to do if you want to import GPS or telemetry locations into GIS. You may wish to modify the instructions to suit your purposes. For example, if you are working with UTM coordinates then disregard the conversion to decimal degrees. Note that both Excel and ArcMap can deal with delimited text (.txt) and dBase tables (.dbf).

The following file names are used:

ORIGINAL DATA

Locations.txt tab-delimited text table of geographic coordinates in Longitude and Latitude - DMS

CREATED DATA

Locations.dbf dBase table of converted coordinates - DD
Points.shp shapefile of point locations in specified projection

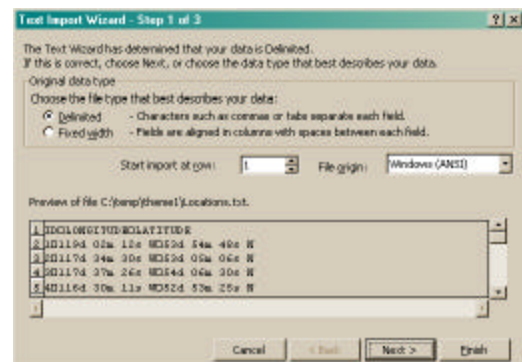
Import table into MS Excel and calculate decimal degrees

The original data used here is from a text file that has values in each field delimited by tabs. If your data is already in Excel then skip to the calculations.

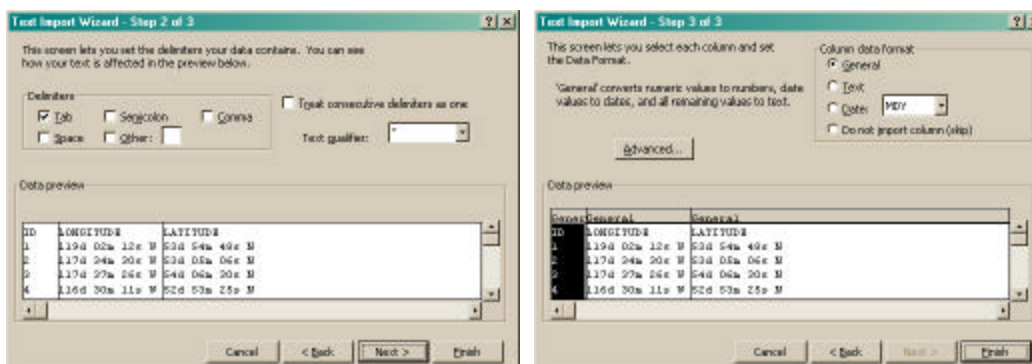
1. Open MS EXCEL
2. Choose FILE → OPEN
3. Navigate to the directory where your Locations.txt file is stored
4. In the “Files of type:” drop-down box, select *Text Files*
5. Select **Locations.txt** and click OPEN

*The **Text Import Wizard** becomes available to help you import the text table in three steps. Note that there are several parameters and options to help you import the data as efficiently as possible.*

6. Step 1: select Delimited and click NEXT



7. Step 2: select Tab as the Delimiter and click NEXT
8. Step 3: click FINISH



You now need to separate the Degrees (d), Minutes (m), and Seconds (s) into their own columns for both Longitude and Latitude to perform the **decimal degrees calculation**. Theoretically, you could create one larger expression to complete the same task.

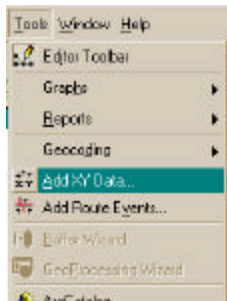
9. Type in the following new column headings:
 - LongD, LongM, LongS, and LongDD
 - LatD, LatM, LatS, and LatDD
10. Activate the cell directly below LongD (Column D) and enter the following expression: **=MID (B 2 , 1 , 3)**
11. Copy and paste the formula from this cell into the remaining cells for that column
12. Repeat the preceding two steps above substituting the appropriate information from the following table:

Column Name (Column Letter)	Expression	Explanation
LongD (D)	=MID (B 2 , 1 , 3)	copies the first three numbers
LongM (E)	=MID (B 2 , 6 , 2)	copies two numbers starting at the sixth
LongS (F)	=MID (B 2 , 10 , 2)	copies two numbers starting at the tenth
LongDD (G)	= - (D2+E2 / 60+F2 / 3600)	calculates decimal degrees the negative indicates Western hemisphere
LatD (H)	=MID (C 2 , 1 , 2)	copies the first two numbers
LatM (I)	=MID (C 2 , 5 , 2)	copies two numbers starting at the fifth
LatS (J)	=MID (C 2 , 9 , 2)	copies two numbers starting at the ninth
LatDD (K)	= (H2+I2 / 60+J2 / 3600)	calculates decimal degrees (FYI: make negative if Southern hemisphere)

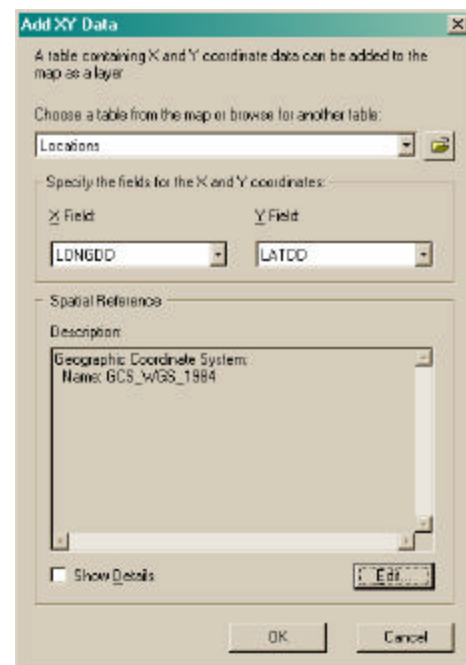
You may need to adjust the cell and number references used in the MID() function to correspond to the DMS format of your data. Next, set the format as Number and specify the number of decimal places in the LongDD and LatDD columns.

13. Select the LongDD column
14. Right-click on the heading and choose FORMAT CELLS... from the context menu
15. Specify **Number** for the Category and **4** for the Decimal Places
16. Repeat the previous 3 steps for the LatDD column
17. Choose FILE → SAVE AS...
18. Navigate to the directory where you want to save to
19. In the “Files of type:” drop-down box, select *DBF 4 (dBASE IV)*
20. Specify the file name (e.g. **Locations.dbf**) and click SAVE
21. CLOSE Excel

Start the ArcMap document and import XY data



1. Open ARCMAP with a new empty map document
2. Choose TOOLS → ADD XY DATA...
3. Navigate to the directory that the table is stored in
4. Select *Locations.dbf* and click ADD
5. Specify the X Field as **LONGDD**
6. Specify the Y Field as **LATDD**
7. Click the EDIT button to specify the spatial reference
8. Click on the SELECT button for a predefined coordinate system
9. Choose GEOGRAPHIC COORDINATE SYSTEMS → WORLD → WGS 1984.prj (or navigate to the system that your data happens to be in)
10. Click ADD then OK
11. Click OK in the Add XY Data window

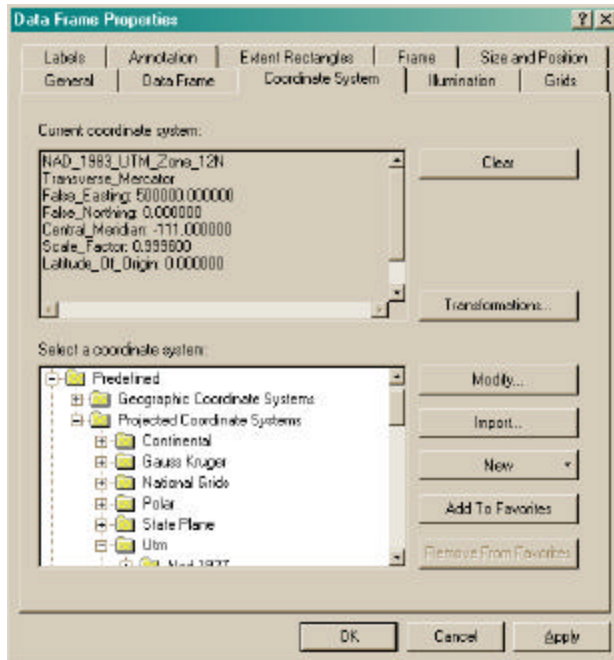


*The locations have been added to the map document as **Locations Events**. This new layer references the original *Locations.dbf* table to display the coordinates. It can be used as is for spatial processing, but to make a permanent geospatial layer → save as a shapefile. At this point you may also opt to add another shapefile to display geographic features with respect to the point locations. In this example, the locations used are within the province of Alberta; therefore, a shapefile of the province is added to the map document.*

Change coordinate system and save as shapefile

You may skip directly to saving the data in a point shapefile, or opt to change the coordinate system from geographic to projected if you need the locations transformed to match other data (e.g. satellite imagery in a UTM projection).

Change the coordinate system from geographic to projected:



1. In the table of contents, double click on “Layers”
2. Click on the COORDINATE SYSTEM tab
3. Select the coordinate system by choosing PREDEFINED → PROJECTED COORDINATE SYSTEMS → UTM → NAD 1983 → NAD 1983 ZONE 12 (or the projection you require)
4. Click OK

Refer to the figures at the end of this document to see the effect of changing the coordinate system.

Export the data to a shapefile:

5. In the table of contents, right-click on **Locations Events**
6. Select DATA → EXPORT DATA...
7. Select how the coordinate system is to be defined: same as source *OR* same as data frame

If you changed the coordinate system and opt to “Use the same Coordinate System as the Data Frame” then the shapefile will be saved with this projection definition. If your data is saved using same as source in a geographic coordinate system then ArcMap can reproject on the fly to match other data sources that have defined projected coordinate systems.

8. Specify a name for the output (e.g. **Points.shp**)
9. Click OK

