

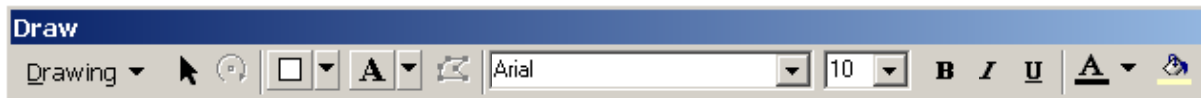
Content Creation, Cropping, and GPS

Overview


I like that term; “content creation”. I always associate it with “inert filler”. For geologists using GIS, there’s no end to the situations in which map details will need to be added or modified. For instance, contacts, faults, sample locations, tracks, etc. etc. As with so many other things we’ve done in GIS, there are many ways map details can be added or modified. I will just be demonstrating one way... it may well not be the easiest or fastest... it’s just one way.

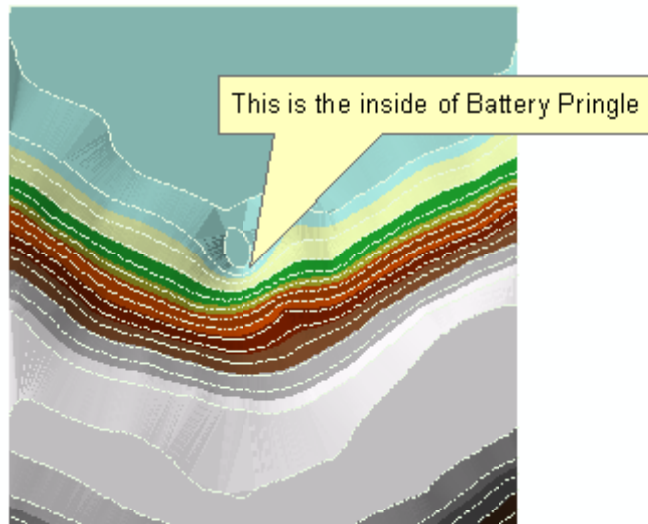
Custom Annotation

All sorts of annotation and objects (aka objects) can be drawn directly on an ArcMap project using the Drawing toolbar.




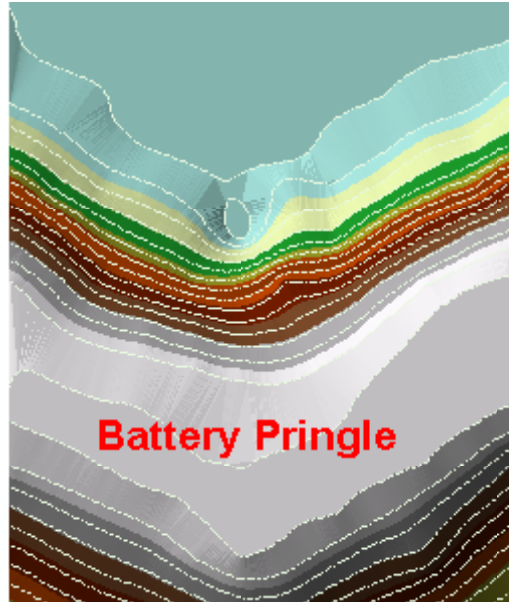
We’ve already looked at the labeling tool, , when we custom placed contour


line elevations. One of the most frequently used graphics is the callout., . Use it for a rather informal but easily visible note on a map. Click on the point at which you want to callout to originate then drag to the position you want the text to appear. Enter text using the input box that appears when you release the right mouse button.

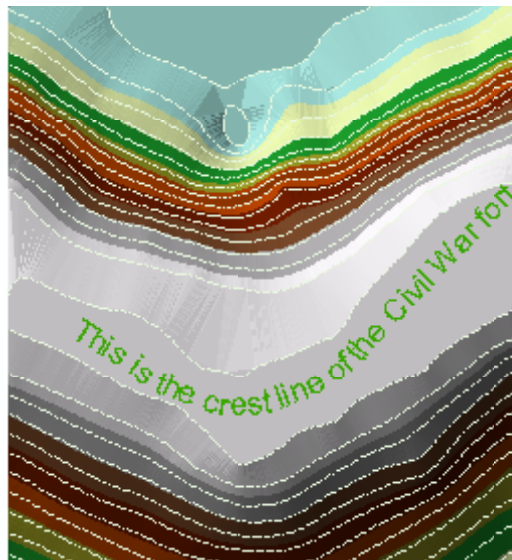


I should note that the “post it note yellow” is very ESRI and folks can always spot something done with an ESRI product from it.

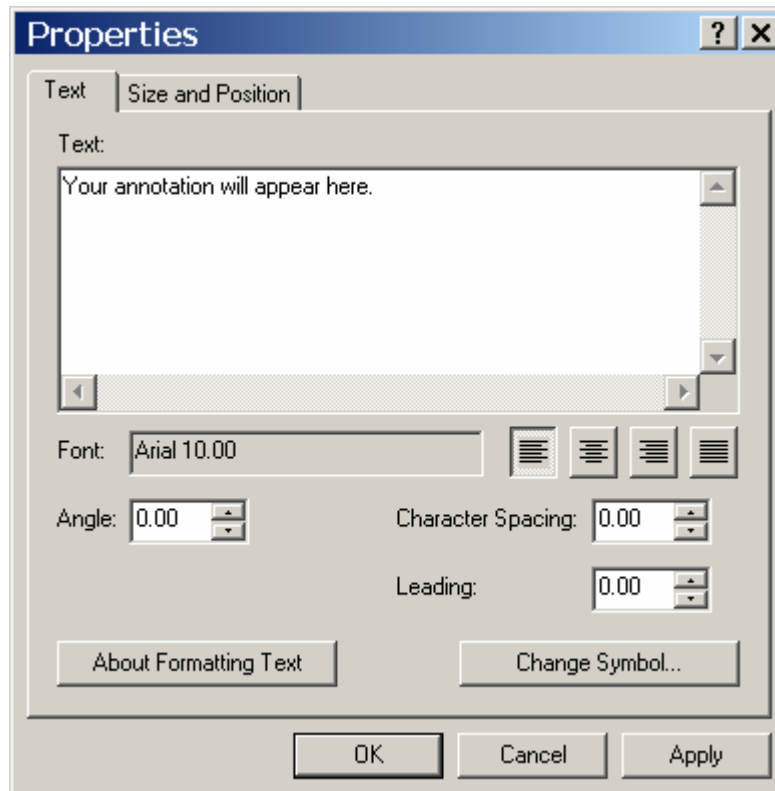
Use the  annotate button to add text directly on the map. Font, size, and color of the text may be selected from the drawing toolbar.



The splined text tool, , is a convenient way to custom label a curved feature such as a river or contact. Select the tool and click at the point at which labeling is to start. Trace out the feature with successive clicks and double click at the ending position for the label. Type in the text you wish to have displayed and click the "OK" button.



With all of these four custom annotating tools, you may change the text or font style by double clicking on the annotation which will bring up this box.








Everything in this box should be self explanatory by now (icons are identical to those in word processing programs).

Adding graphics directly to a theme

Adding graphics to a theme may also be done using the drawing toolbar and




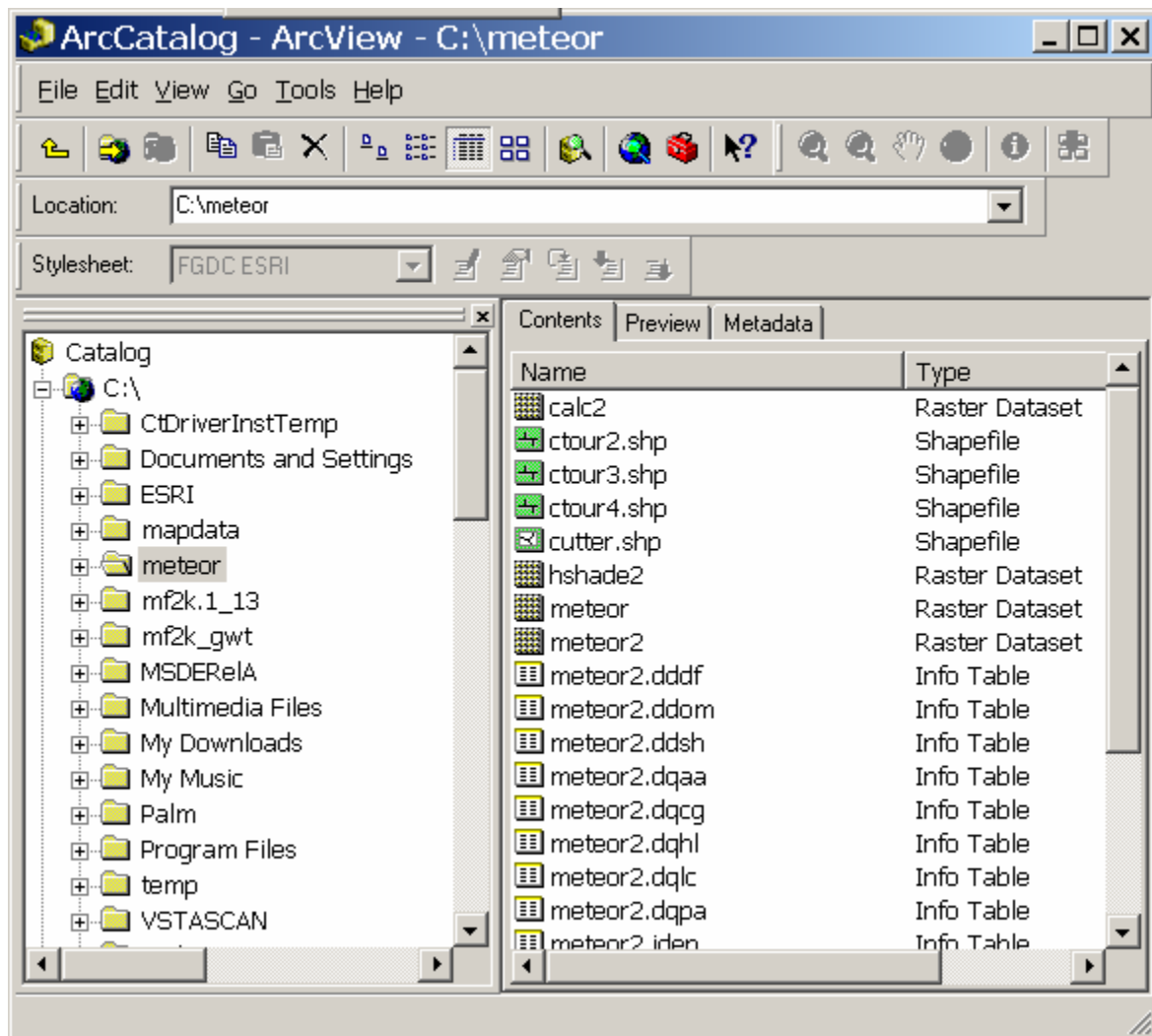
one of the various drawing tools. Use of these tools is easy and

intuitive.  draws a new rectangle,  draws a new polygon, etc.  and  draw new unsplined and splined lines respectively.  draws a “freehand” line (unlike the previous line creating tools, it is used by clicking and dragging).

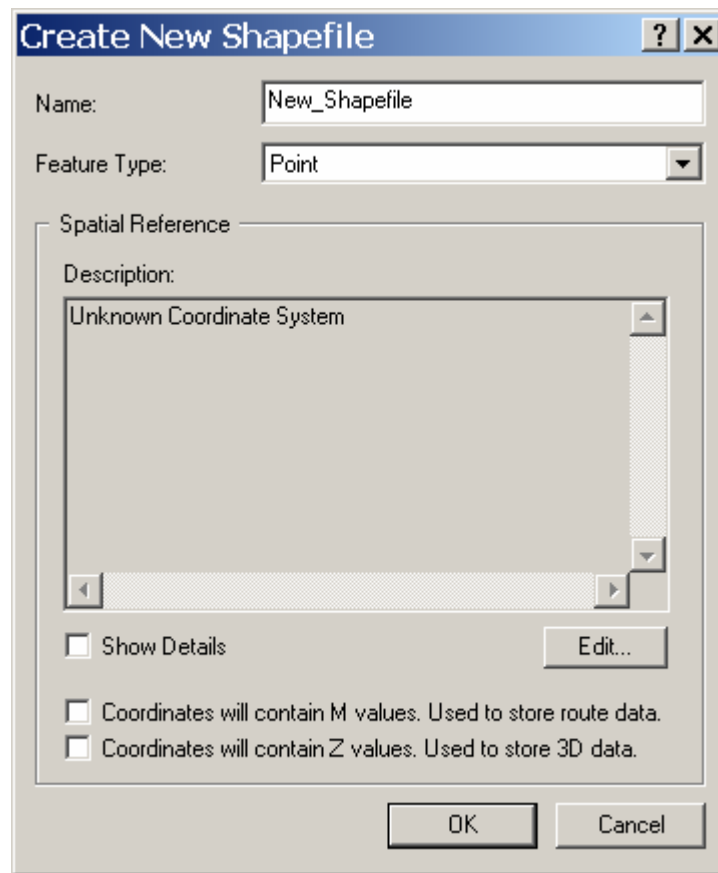
Adding new Features to a new (or existing) theme

In many, perhaps most, situations, it is a good idea to add additional features and graphics to a new theme which may be overlain on an existing theme rather than adding graphics to the existing theme. For instance, if you were annotating the geologic map of Kentucky to show stops on a field trip, it would make more sense to make a new theme containing only the trip information rather than altering the geologic map of Kentucky and thereby making it unsuitable for future use.

Start by creating a new shapefile t6home with ArcCatalog by clicking the  on ArcMap or launching it from the Start menu.



Navigate to the location where you'd like to save the new shapefile (give this some thought... putting it in an inappropriate or difficult to get to location will cause problems further down the road). Right click on the folder in which you'd like to place the new shapefile, pull down to "New" and select "Shapefile".




Give the new shapefile some appropriate name. It's important to select the shapefile type. If you're going to use it to show stop locations, "points" may be appropriate. Lines would be appropriate for trip routes and polygons might be appropriate for outcrop maps. Although not essential, it's a very good idea to specify some projection system... it probably makes the most sense to use the projection of the map over which the new theme is to be placed.

Bring the new theme you created into the project containing your base map(s) and start the editor tool.



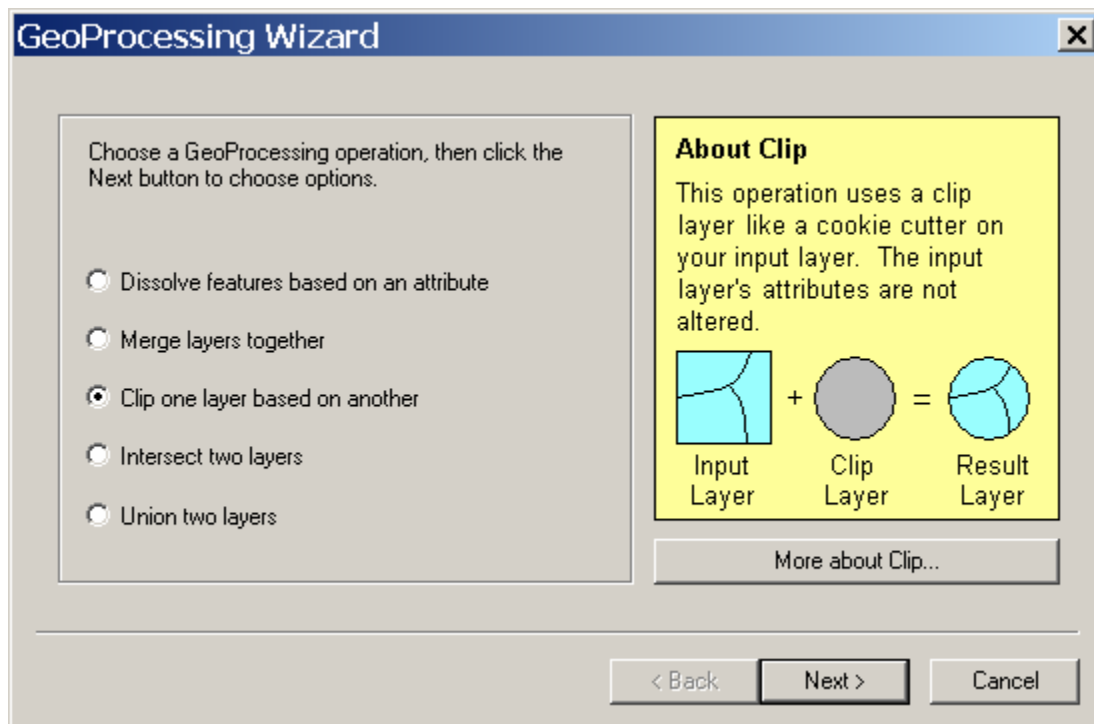
We've used this tool before so everything should be familiar. *Make sure that the target window is showing that you're making changes to your new shapefile not the base map.* Note that by changing the task and tool you can move the entire

feature or single points of the feature. Use the  tool to rotate a feature.

Don't forget that you can also modify the attributes table of your new shapefile. Add new fields to add information about each feature. This information can be used for annotating and labeling your map later.

Cropping a shapefile

We've already cropped a raster dataset last week. I wish that ESRI used the same procedure for cropping a shapefile... but they don't (although it starts the same way). The first thing to be done is create or procure a polygon shapefile with the "cookie cutter" shape for cropping. It's essential that this shapefile be a polygon. You may either create it using the same procedure we did above or you may modify an existing file, such as the Ohio County Boundary map we used before. Select Tools>Geoprocessing Wizards.



Specify "Clip one layer based on another" and click next.

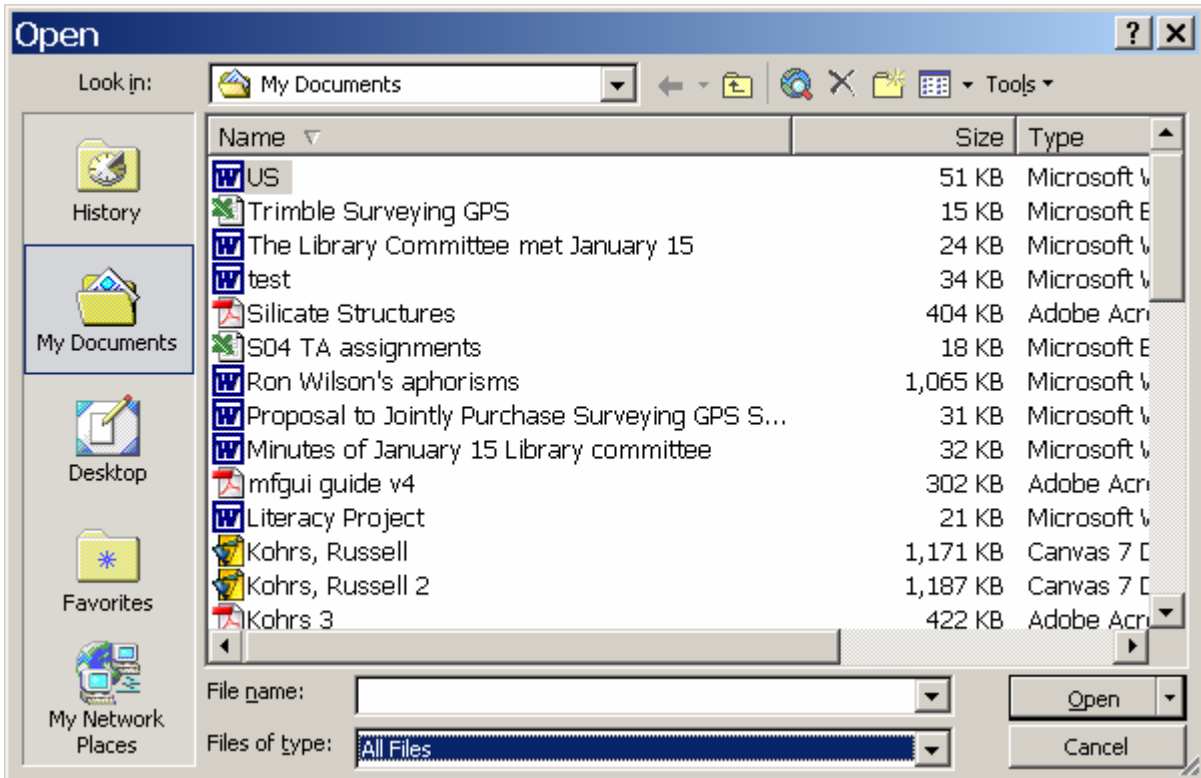


Select the shapefile to be cropped in the top window (ESRI uses the verb “clip” rather than “crop”) and the shapefile to crop (clip) to in the middle window. Make sure you specify the name and location of the output (cropped) shapefile in the bottom window. When you press “Finish”, a new shapefile cropped to the clipping file will be created and added to the project. Note: the original shapefile will be left unaltered.

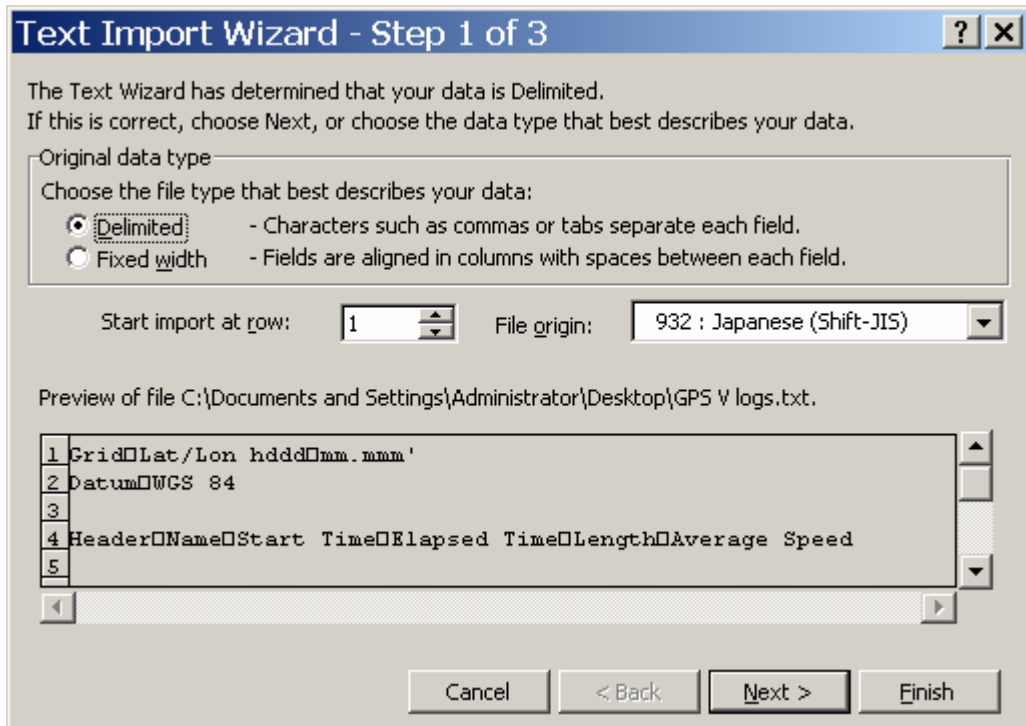
Using data collected with a GPS

There are many situations in which you’ll want to display data collected with a GPS on a map. We’ll start by assuming you know how to use your GPS and how to collect data with it. I own a Garmin GPS V (and love it). I can collect individual positions as “waypoints” and multiple points along a traveled line as “tracks”. These data can be easily downloaded from the GPS as ASCII files on my PC. We’ll start with these ASCII files.

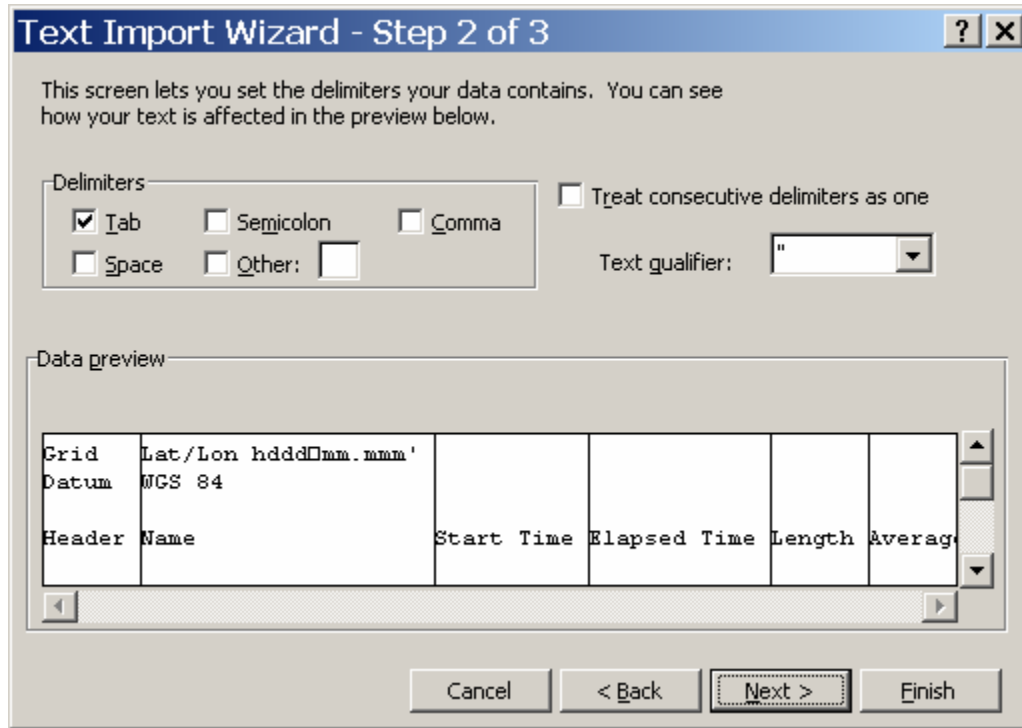
Read the data into Excel. Remember the data files will not show up unless you specify “All Files” in the “Files Type” window.



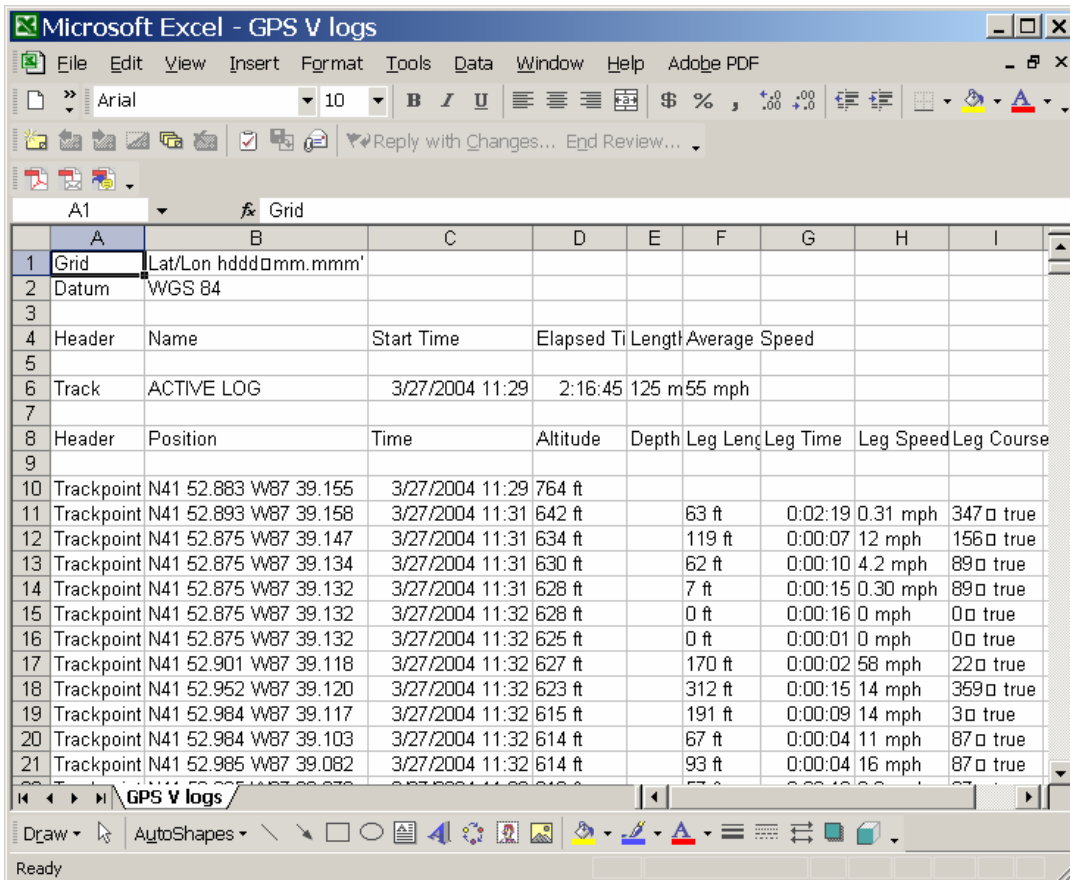
Because the files are not Excel worksheets, Excel will launch a wizard to help you define your data.



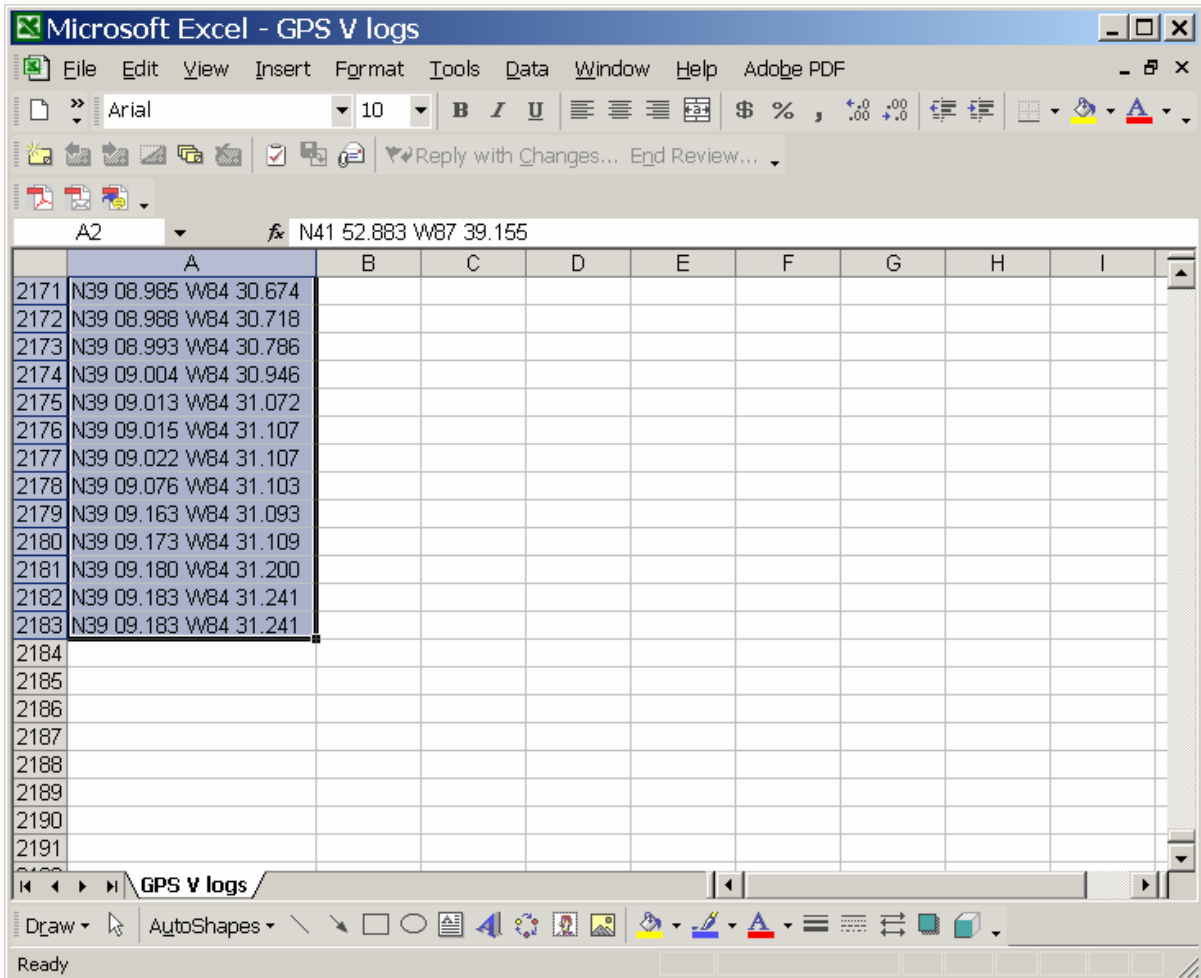
Garmin's data is tab-delimited by default so I press "Next"



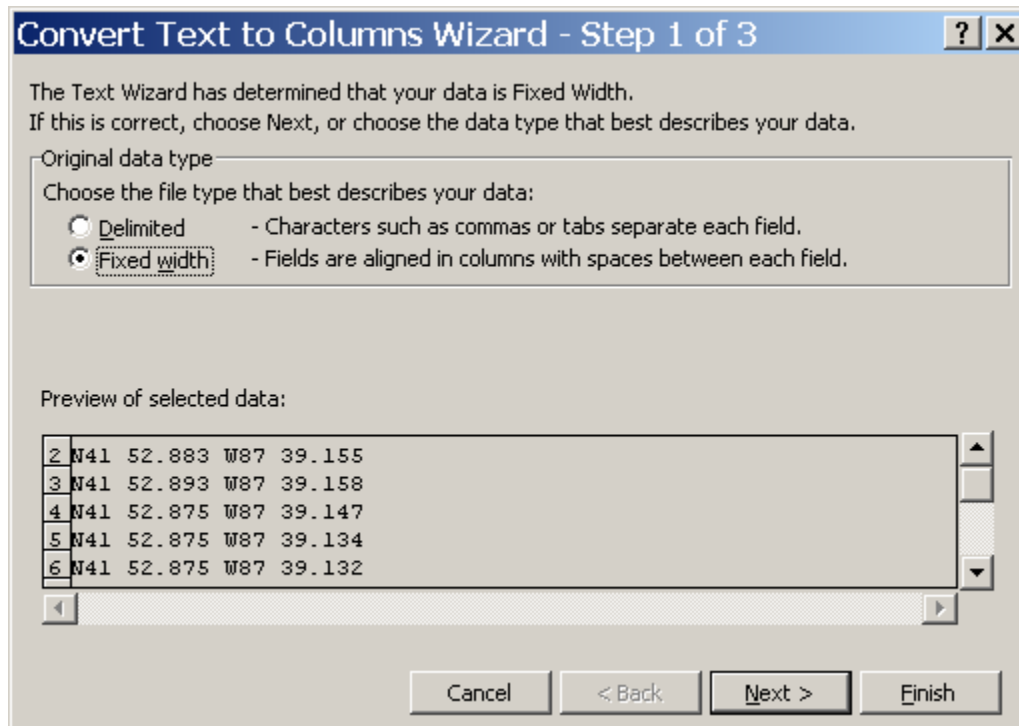
Then press "Finish". My spreadsheet now looks like this:



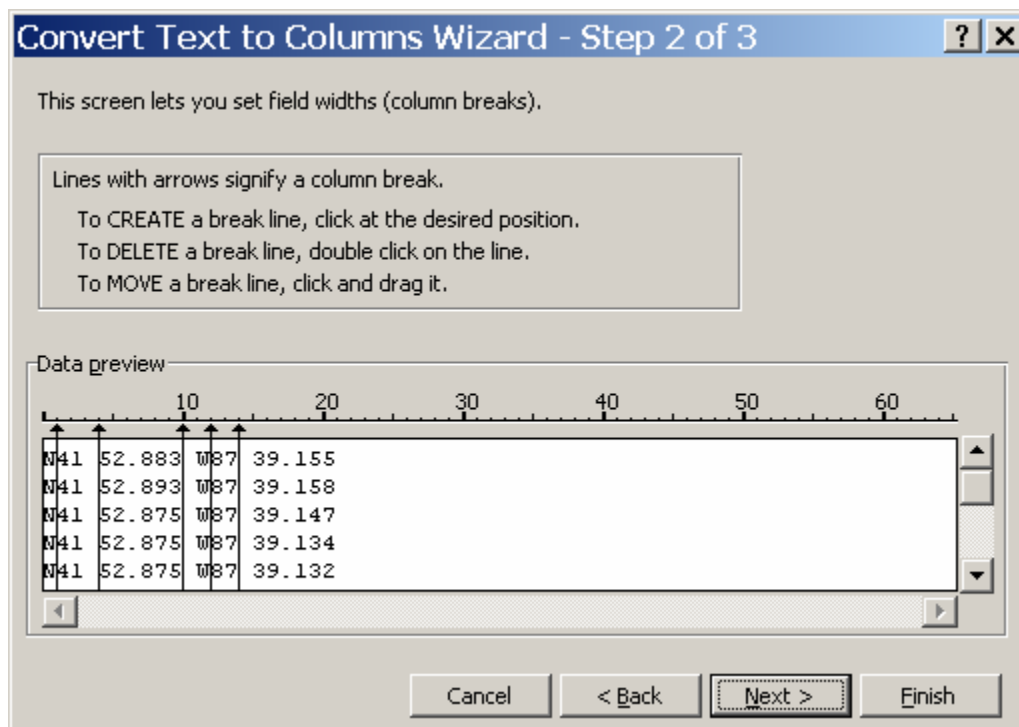
Although all the data is interesting (did I exceed the speed limit), I'm most interested in where I've been so I eliminate all other data. Except column B. Now we have to get the positional data into a form readable by other software packages. There are many possible formats but perhaps the most usable is digital degrees. First let's separate latitude and longitude into separate columns. Highlight the position columns.



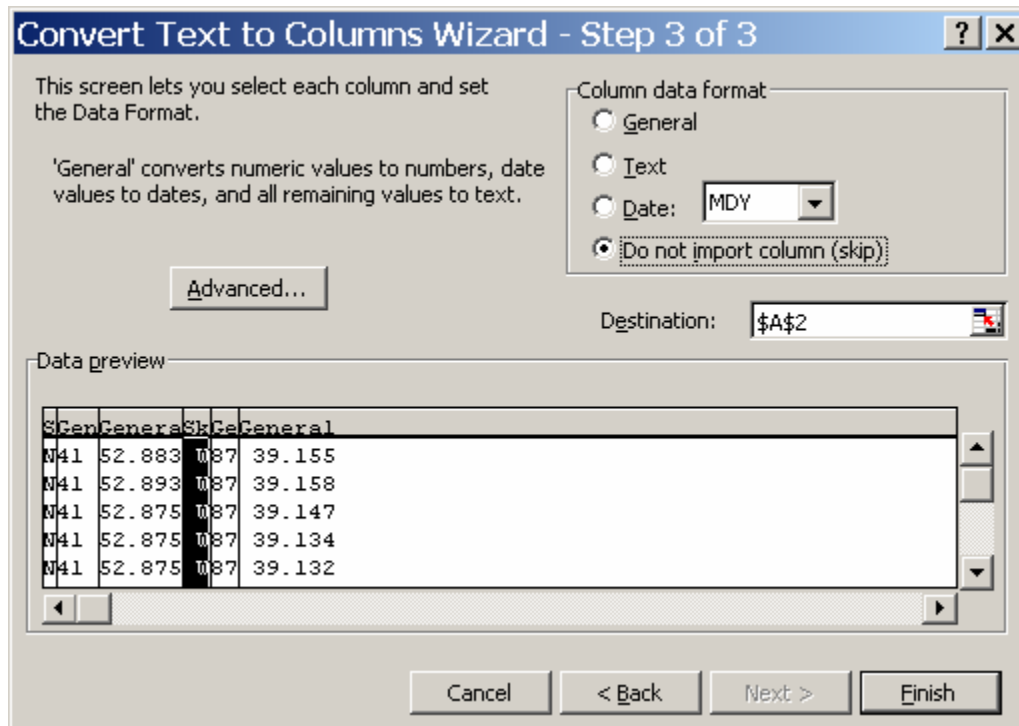
Select Data>Text to Columns...



Select "Fixed width" and press next.



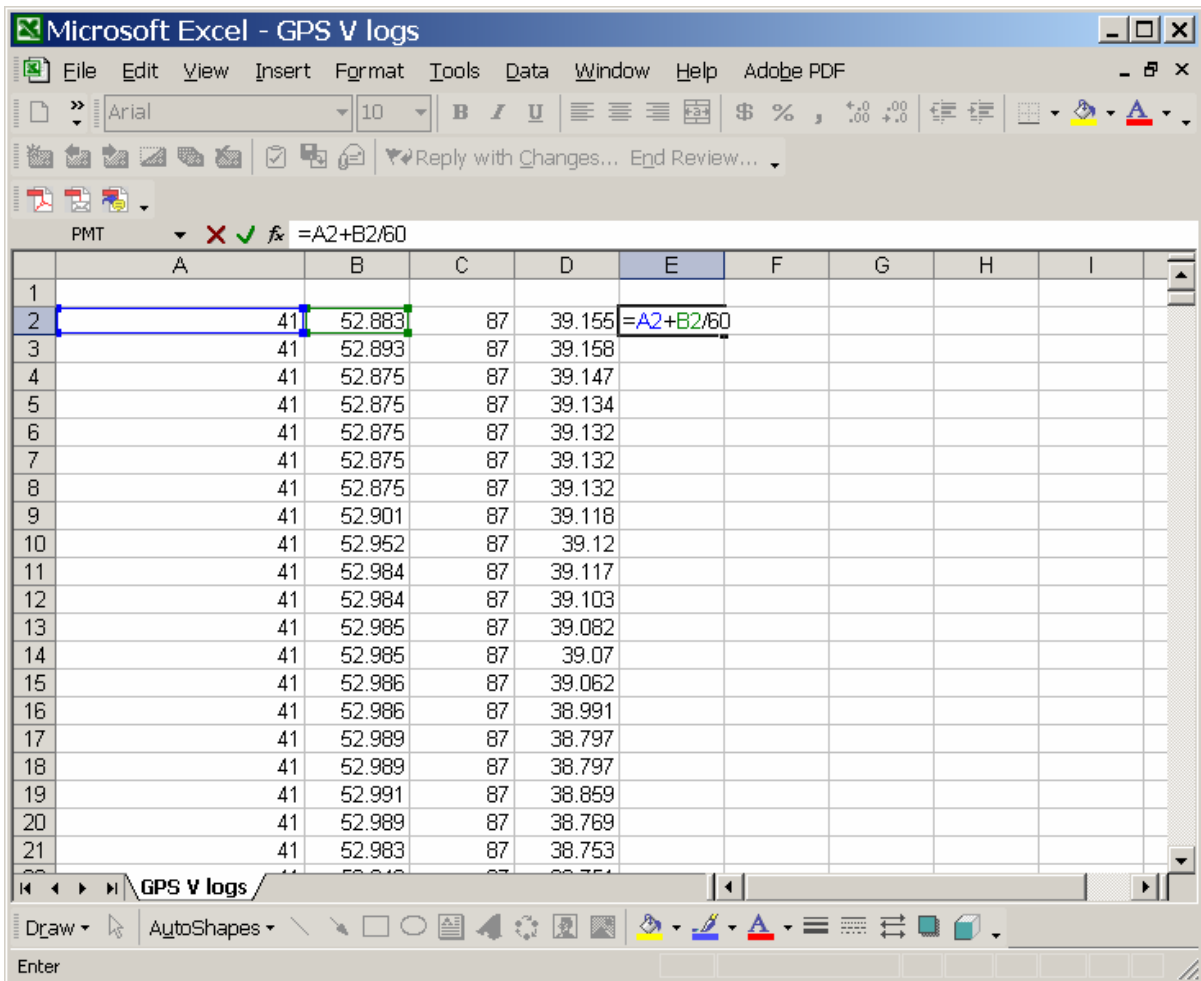
Place arrows to separate the fields and press next.



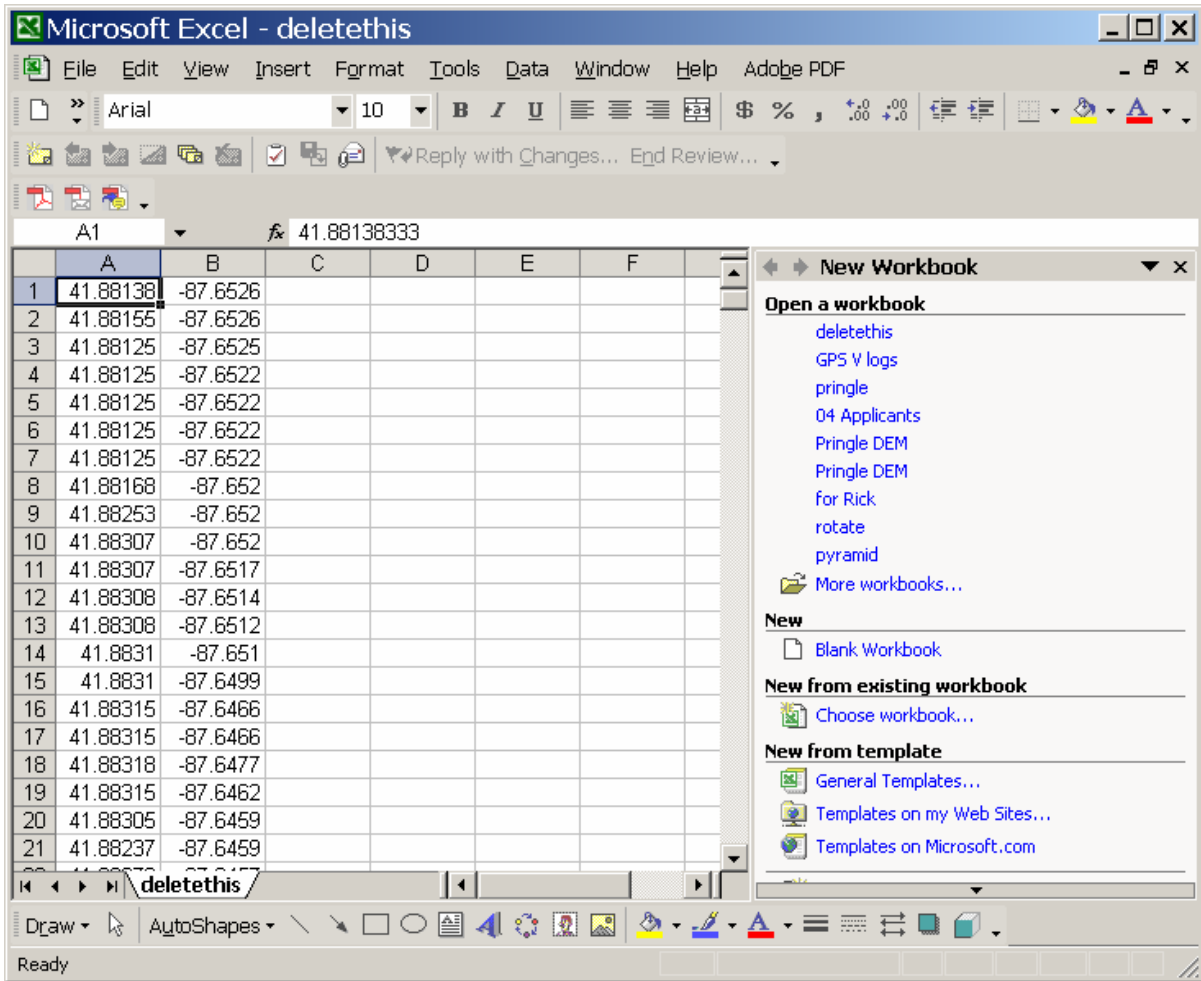
Highlight the column containing “N” and “S” and select “Do not import column (skip)”. Press Finish.

	A	B	C	D	E	F	G	H	I
1									
2	41	52.883	87	39.155					
3	41	52.893	87	39.158					
4	41	52.875	87	39.147					
5	41	52.875	87	39.134					
6	41	52.875	87	39.132					
7	41	52.875	87	39.132					
8	41	52.875	87	39.132					
9	41	52.901	87	39.118					
10	41	52.952	87	39.12					
11	41	52.984	87	39.117					
12	41	52.984	87	39.103					
13	41	52.985	87	39.082					
14	41	52.985	87	39.07					
15	41	52.986	87	39.062					
16	41	52.986	87	38.991					
17	41	52.989	87	38.797					
18	41	52.989	87	38.797					
19	41	52.991	87	38.859					
20	41	52.989	87	38.769					
21	41	52.983	87	38.753					

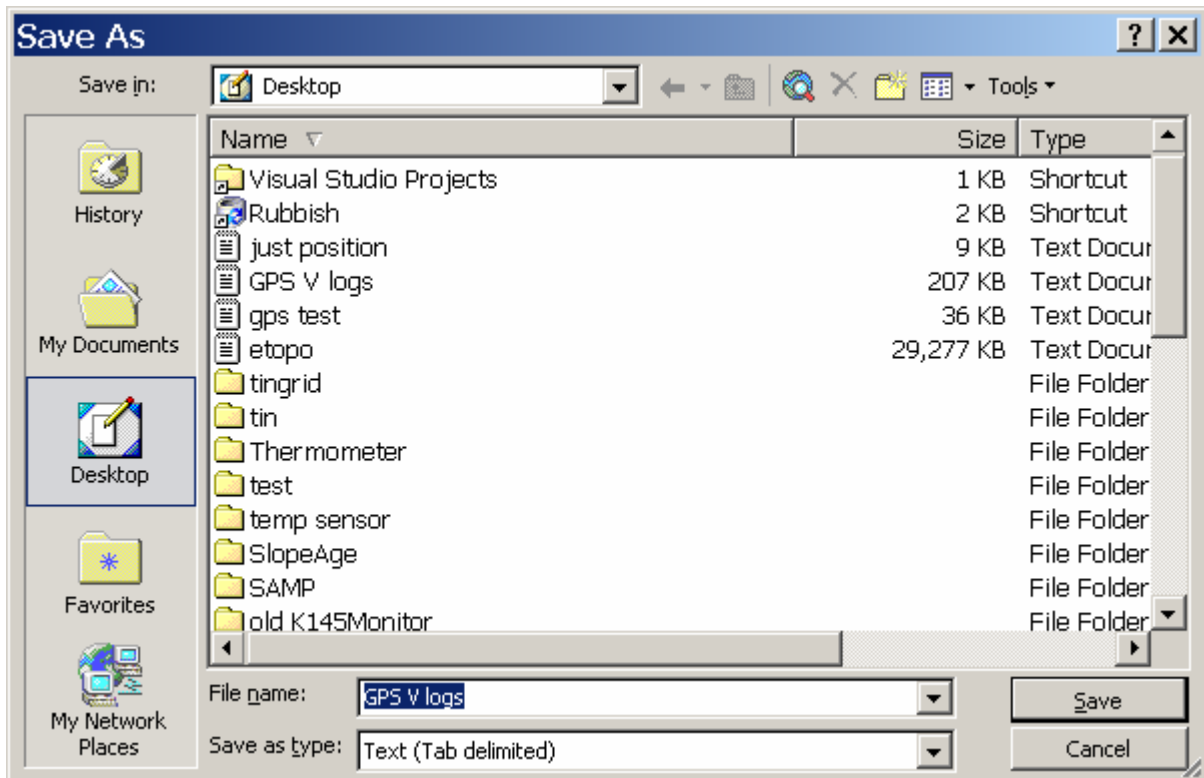
Combine degrees and minutes to digital degrees.



Eliminate unused data and label columns. Because most (but not all) programs expect longitude as “Easting”, West longitude needs to be expressed as negative East longitude

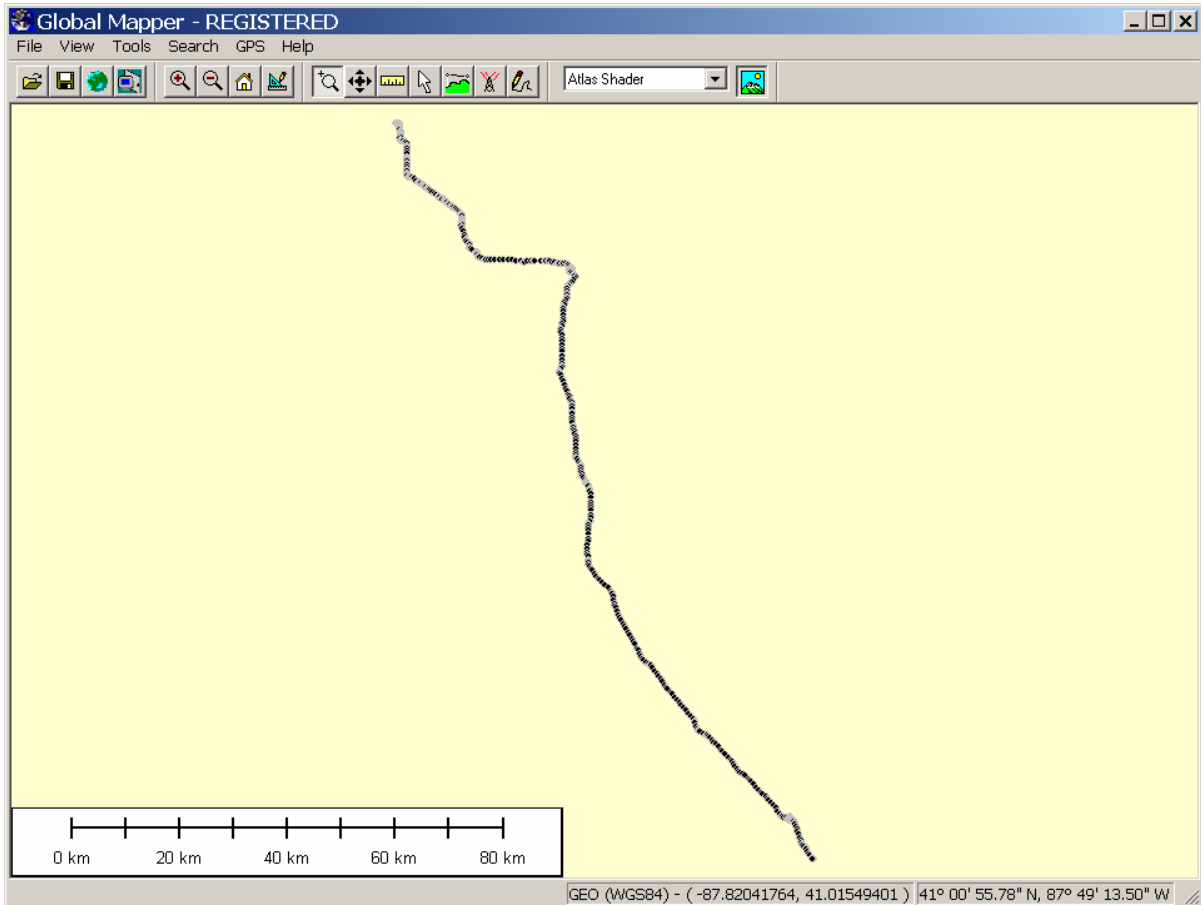
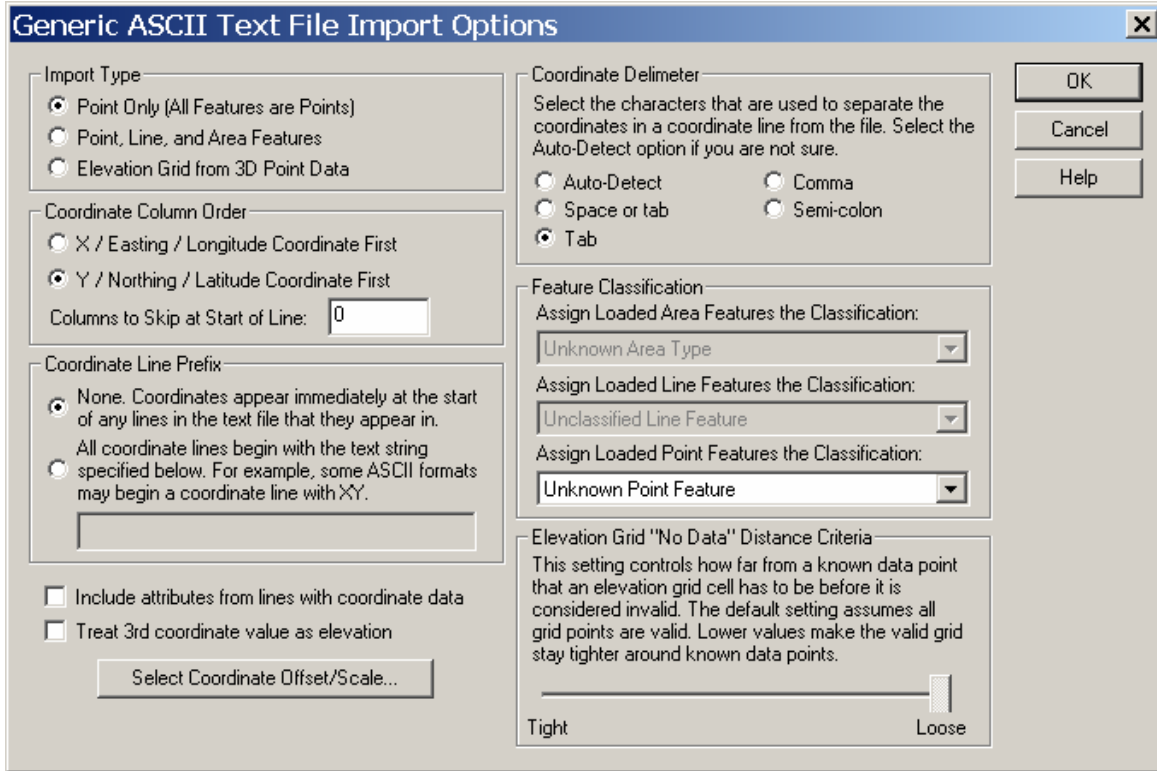


Save the spreadsheet as text.



The data created in this way could be read by several programs including ArcMap but, as we've seen so many times before, I like Global Mapper so let's use it.

Open Global Mapper and select File>Open Generic Text ASCII file(s) and make the selections appropriate for your data (remember we had Northings first. When everything has been set up, click "OK" (and cross your fingers).



The GPS data may now be exported to a shapefile (the same way we've done several times before). My GPS uses WGS84 so I specify that for the shapefile using ArcToolbox. This shapefile may now be read directly by ArcMap and overlain on an appropriate base map.

