Lesson 4, creating new shapefile point layer based on GPS coordinates, and presenting the data on a USGS topo map.

PREPARE THE BASE MAP

1. Make sure the now-familiar CDOT county shapefile layer is ready and unzipped on your desktop.
2. For the USGS map, we will need the INDEX for the 24K maps. You can download this at http://data.geocomm.com/quadindex/ Download and unzip to your desktop.
3. Open uDIG and load th cnty.shp (from CDOT), and the 24Kgrid.shp (from USGS) layers into your map. Do NOT change the projection--since we will be working with GPS data, we want the datum to remain WGS 84 lat/lon coordinates.
4. Center the cnty layer on your map by right-clicking the layer in the left panel, and select "Zoom to Layer".
5. Label the 24Kgrid layer so that the 15minute map names show up on your map. Make the font smaller so that all the grids are labeled for Archuleta.

GPS COORDINATES

1. Make sure your GPS coordinates are in decimal degrees. Convert if necessary.
 (Google " FCC degrees minutes seconds " (no quotes) for a nice converter.)
2.Using the Lat/Lon coordinates as your guide, figure out which 24K map you will need for your map. Because uDig is very slow in rendering graphics,we won't add the USGS layer to our map just yet, but we will download and get it ready.
3. Go to librmap.org to download the USGS map. DATA>COLORADO, then click the link "View entire list of USGS Colorado Digital Raster Graphic maps". Download both the TIFF (which is the image) AND the TRW (which is the "world" file, used to locate imagey to a GIS. Put both files in a folder on your desktop.
4. Back in uDig, zoom into the area where your first GPS point will be. Use the Lat/Lon coordinates shown on your map as your guide. You should have at least four digits of precision after the minutes.

5. Now add the USGS layer to your map.

CREATE THE GPSPOINTS LAYER

1. This beta version of uDig does have a "Create Layer" feature. Go to the Layers menu, select "Create"
2. You will need to do several things here:
a. change the name of the layer to "GPSpoints" (best practice: remove spaces from filenames)
b. change the "geometry" type to "Point"
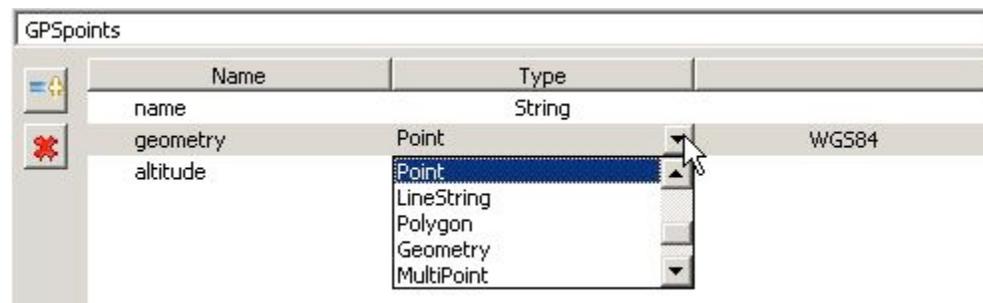
c. add a field, name it "Altitude" and change it's type to "Double".
d. Click "OK" You should see the layer appear on your layers list on the left.
3. Make sure that "GPSpoints" is selected, and open the Table editor on the bottom panel. If you don't see it there, go to Window> Show View> Other>Other, and select "Table View"
4. uDig is quite quirky, I have found, so you might have to switch among the layers to have the GPSpoints layer show its attributes. Bascially, we will be creating a set of points and adding attributes to each point (name, altitude).
5. Make sure the GPSpoints layer is selected, then select "Create point tool" and click to create each point by matching your cursor coordinates with your GPS coordinates.
6. Label each point with one of the attributes you created in the table editor.
7. When you are done, select the GPSpoints layer and select "Export". You can now use this layer in other GIS software.
There are other Open Source GIS that may be better than uDig, try Quantum GIS.