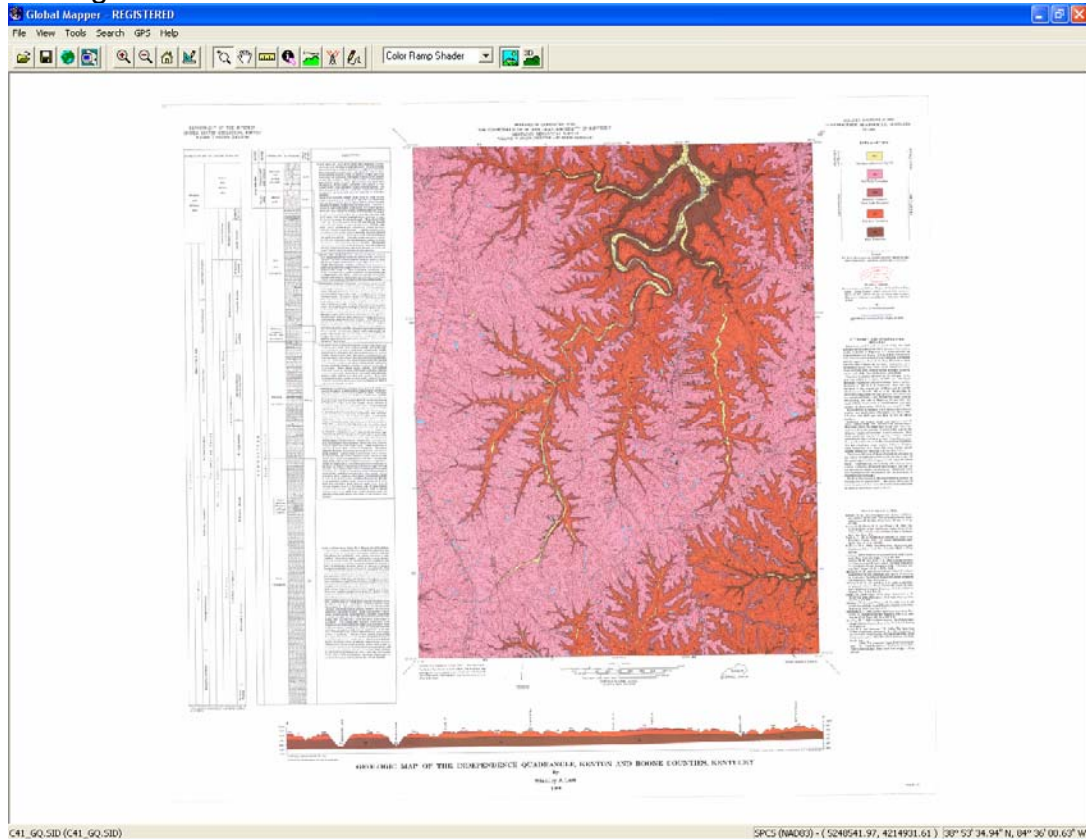


# Uncollaring a Kentucky Scanned GQ

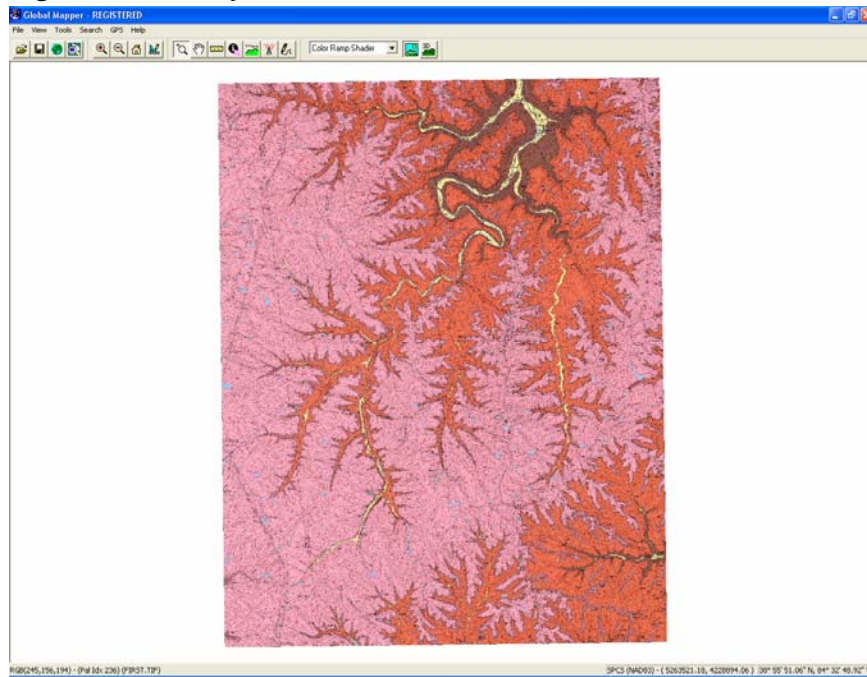
## Overview

This “How to...” outlines a simple procedure for removing the legend, key, cross sections, scale bar, etc. from a scanned USGS 7.5' Geological Quadrangle map (GQ) (fig. 1) leaving only the map itself (fig. 2). This process, sometimes referred to as “uncollaring” permits the relatively seamless mosaicing of adjacent quadrangles.



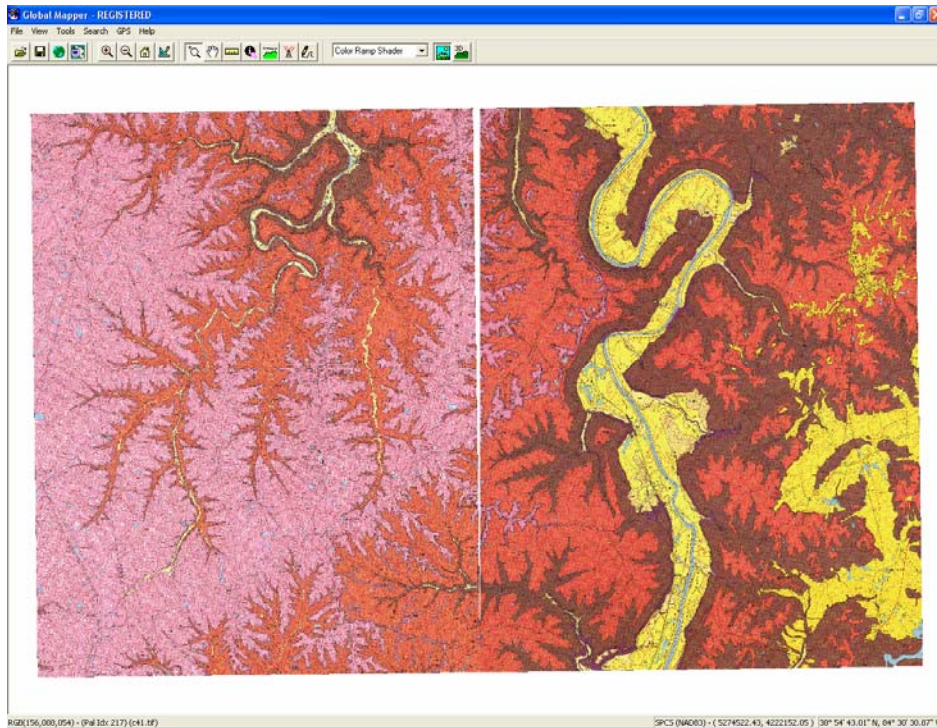
**Figure 1.** "Collared" Geologic Quadrangle

The Kentucky Geologic Survey provides a wonderful site for obtaining both collared and uncollared GQs for the entire state at <http://www.uky.edu/KGS/gis/gqmaps/index.html>. The GQs are not listed by quadrangle name but rather by a letter (increasing north to south) and number (increasing west to east). Use the map index <http://kgsweb.uky.edu/download/topo/kyindex.pdf> to find the quadrangle of interest. In this demonstration, we'll be using the Independence and Alexandria quadrangles (C41 and C42 respectively). The collared GQs are in MrSID format (a compressed format developed by LizardTech that combines geographic registration like GeoTiffs with compression of formats like jpeg). In addition to collared GQ, the Kentucky Geological Survey provides uncollared GQs as zipped GeoTiffs.

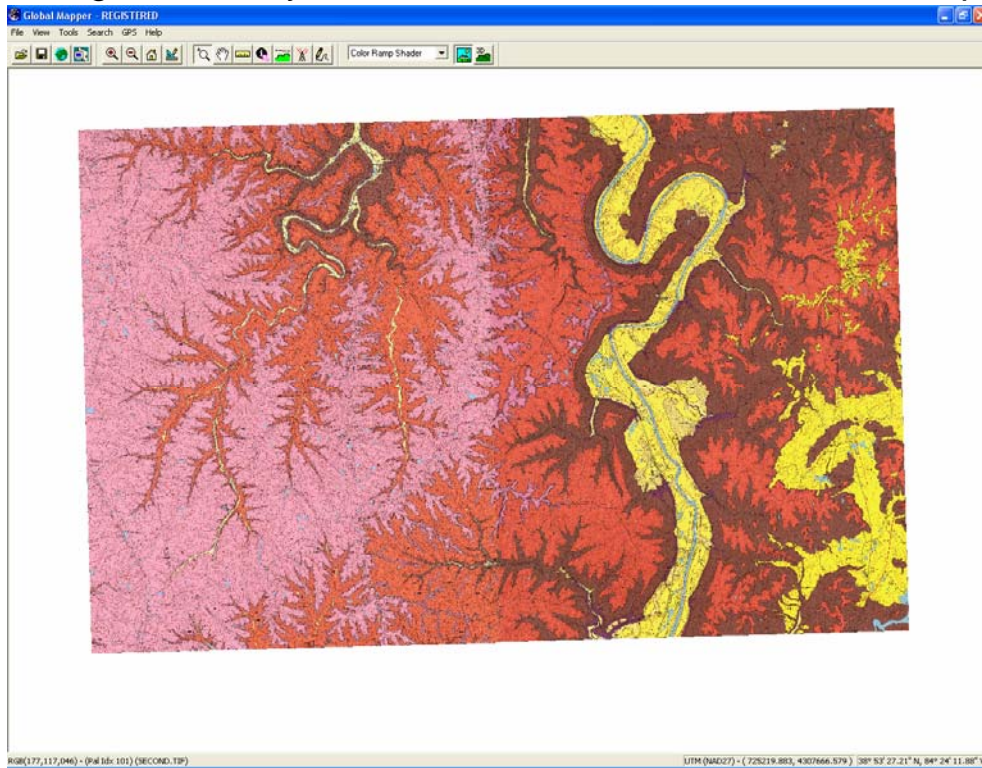


**Figure 2.** “Uncollared” Geologic Quadrangle

Although the uncollared GQs are a wonderful time saver, frequently there are noticeable gaps between adjacent GQs when they are mosaiced (fig. 3). It is often possible to uncollar the collared GQs and achieve a closer fit between adjacent quadrangles (fig. 4). Although this can be done in several ways by different software, I’ve found it particularly easy to use GlobalMapper (<http://www.globalmapper.com/>) although others may prefer ArcGIS.



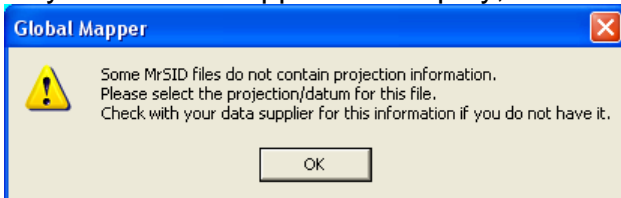
**Figure 3.** Gaps are frequently formed between adjacent uncollared GQ downloaded directly for the KGS site.



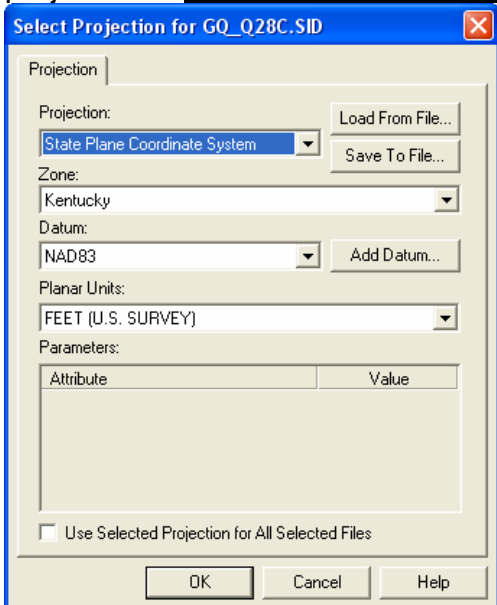
**Figure 4.** A better fit (without gaps) may be achieved by uncollaring the GQs with Global mapper.


**Procedure**

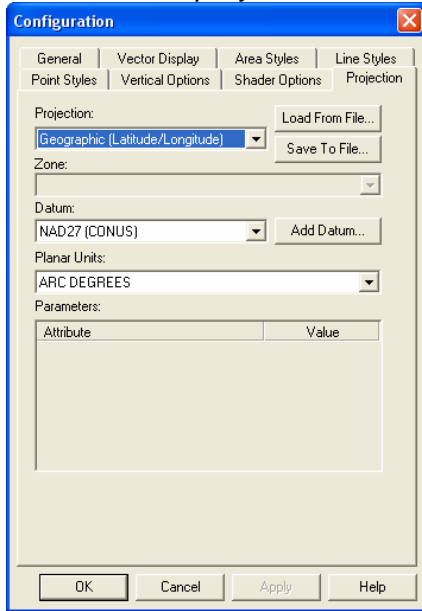
1. After downloading a collared GQ, open it with GlobalMapper. I don't know why but GlobalMapper will display,



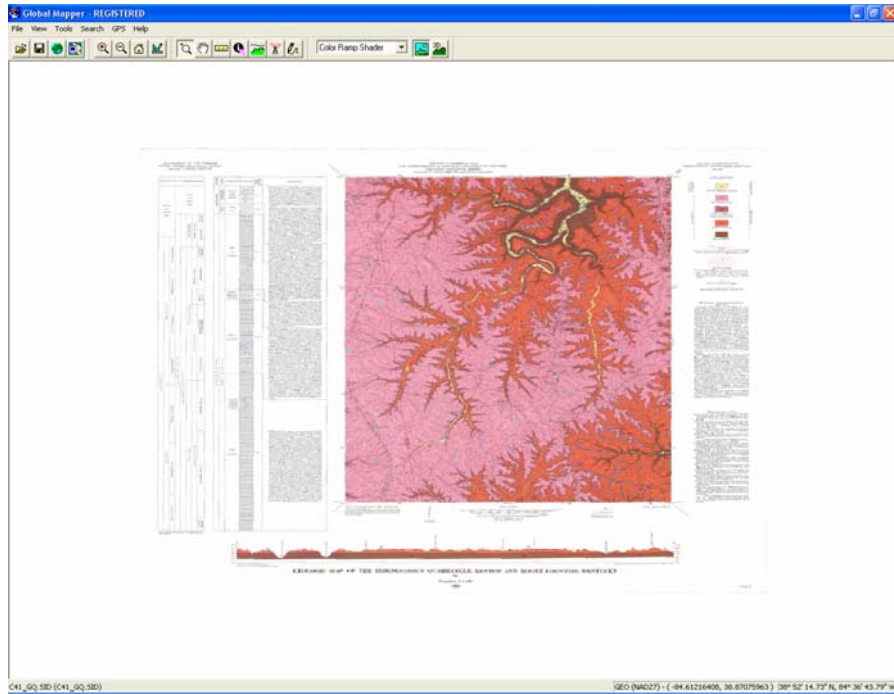
and ask you to verify that the projection is *Kentucky Single State Plane Zone, NAD 83, US Survey Feet*,



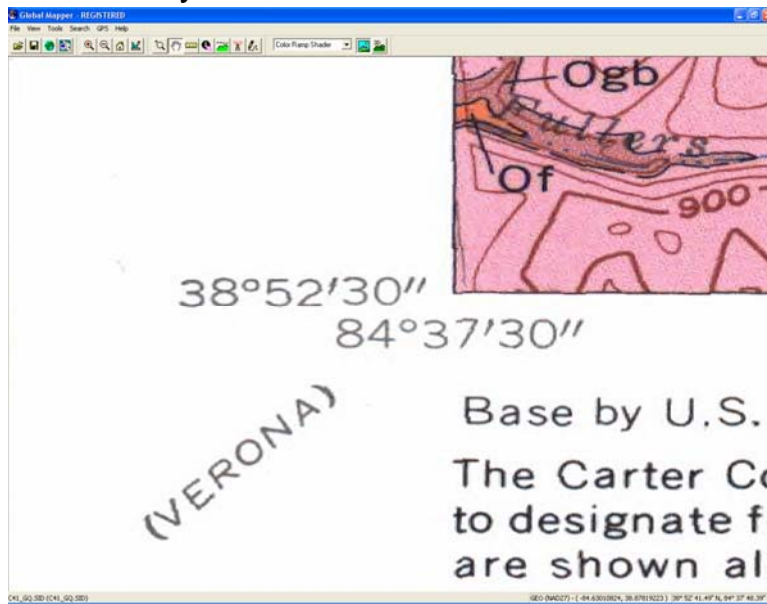
- Click the configuration tool, , to bring up the configuration dialogue box and click the projection tab, Change to geographic coordinates,




- After clicking “OK”, the map should be displayed in geographic coordinates and should be a perfect square, 7.5’ on a side (fig. 5). Notice also that the sides of the square are perfectly N-S and E- W. It should be noted that GlobalMapper can only uncollar the map if the edges of the collared area are parallel to the viewer frame.

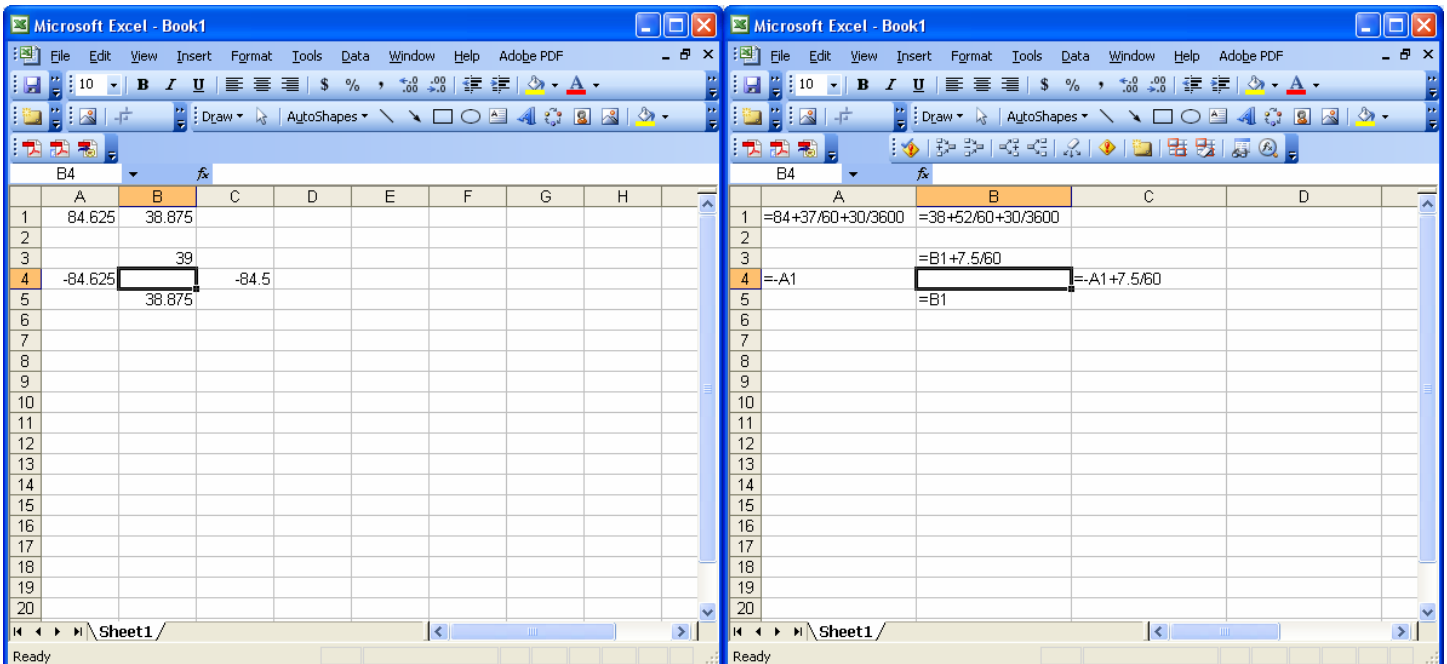


**Figure 5.** In geographic coordinates, the mapped area should appear perfectly square and parallel to the edges of the viewer frame..



**Figure 6.** Magnify the lower left-hand corner of the map to get its geographic coordinates.

4. Use the magnifier tool, , to look in the lower left hand corner (*i.e.*, SW corner) of the map (fig. 6) to find its geographic coordinates.
5. It is necessary to specify the latitudes and longitudes of the map area in decimal degrees. I prefer to calculate this in Excel but it may be easier to do with a calculator (figs 7). Remember that in the US we use longitude West of the prime meridian rather than degrees east as does the rest of the world. Degrees west are negative degrees east (see formulas in right frame of fig. 7).



**Figure 7.** Calculate latitudes and longitudes of the mapped area of the GQ in decimal degrees..

- In the GlobalMapper pull-down menu select **File>Export Raster and Elevation Data>Export GeoTiff** and click on the **Export Bounds** tab of the resulting dialogue box. Click on the Lat/Lon (Degrees) radio button and enter the bounding latitudes and longitudes (Fig. 8).

The screenshot shows the 'GeoTIFF Export Options' dialog box with the 'Export Bounds' tab selected. The 'Lat/Lon (Degrees)' radio button is chosen. The bounding coordinates are: North 39, West -84.625, South 38.875, and East -84.5. Other options include 'Global Projection (UTM - meters)', 'Corner w/ Size - Global Projection (UTM - meters)', 'MGRS (Military Grid Reference System) Bounds', and 'Crop to Selected Area Feature(s)'. The 'Reset to Last Exported Bounds' button is also visible.

**Figure 8.** Enter bounding latitudes and longitudes of the mapped area. Remember that degrees west longitudes are negative degrees east longitude.

- Click "OK" and save the uncollared GQ (now in GeoTiff format).

### **Final thoughts**

Once GeoTiffs have been created for each GQ, they can be mosaiced together (provided they are adjacent to one another). This may be done easily either in ArcGIS or GlobalMapper. Once again, I prefer to do it GlobalMapper. Just read in each uncollared GQ into GlobalMapper and export them to one mosaiced GeoTiff with **File>Export Raster and Elevation Data>Export**

**GeoTiff.** Remember that a raster image of a GQ will never be equal to a map made with vector shapefiles. Kentucky now has shapefiles for many of the state's quadrangles (and plans ultimately to have them available for the entire state). Unfortunately, at least at present, the shapefiles are not distributed free... although there is an excellent geologic map of the entire state (see <http://www.uky.edu/KGS/gis/geology.htm>).

Although this "How to..." has focused on GQs of Kentucky, the same procedure can be used to uncollar any scanned GQ. Remember, however, that prior to uncollaring, the scanned GQ must be geometrically registered (I will ultimately get around to writing a "How to..." on geometric registration using GlobalMapper).