# Global Mapper and Map Tiler

Global Mapper is a very useful and easy to use program to make topographic and bathymetric maps from DEMs (Digital Elevation Models).

Map Tiler is a free software package that takes a large TIFF file output from Global Mapper and creates both tiles and the associated KMLs for display on Google Earth. Similar to pyramids in ArcGIS, the tiles enable only the information relevant to the region and resolution shown on Google Earth to be loaded at one time. When the region or resolution requirements change, new tiles are automatically loaded. This enables much faster loading times when viewing the topographic or bathymetric images on Google Earth.
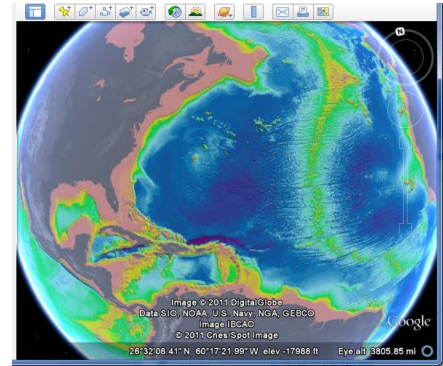
Global Mapper – Downloading Data Using the Built-In Links

- Open Global Mapper
- When the program opens, choose the middle option:
  "Download Free maps/Imagery from Online Sources"
- Note the wide variety of data sources built into the program.
- In the window that opens, choose U.S. Data > United States Elevation Data (NED) (10m resolution)*
    - *The connection with this data source can be spotty. If you have problems and Global Mapper stops responding, switch data sets to Popular Sources > ASTER GDEM Worldwide Elevation Data (1.5-arc-second Resolution).
- In the radio buttons below, choose "Specify latitude/Longitude Bounds of Area", and enter the following values:
  West -122.25
  East -120.5
  North 37.0
  South 36.25
- Press OK.

You should now see some data for the Monterey Bay area before you.

Save this data into Global Mapper native format by pressing "File > Export Global Mapper Package File". It is important to save data that you have downloaded so that each time you want to use the data, you don't have to download it over again. Give the file a name in folder dedicated to this Global Mapper data with a file name like MontereyNED, or MontereyGDEM, or something indicating the place and the data source. The ensuing dialog will give you the opportunity to grid the data, which can speed upload times when not using the entire data set. I believe this option is similar to pyramids in ArcGIS.

To save some of the settings for the data, such as color scheme, boundaries, and things like that, choose File > Save Workspace and give it a name that clearly connects it to the data.

This section is mainly to illustrate both the wide variety of data that Global Mapper has built-in routines to download, and how to save basic aspects of the data so that you won't have to download it over the Internet each time you want to use it.

Global Mapper – Downloading Data from Internet Data Sources

Some of the best combined near-shore bathymetry and coastal topography data sets are at the NOAA Inundation Digital Elevation Models:
http://www.ngdc.noaa.gov/mgg/inundation/

Go there now.

Explore the site and note the wide variety of regions for which data are available.

We've explored the site and identified a fairly small data set (47MB) to use as an example. Navigate to the west Pacific data sets by clicking on the red box over the west Pacific. Download the "Midway Atoll" data set to your Global Mapper folder.

Use Windows Explorer to extract the files in the downloaded zip file, saving them to a folder called "MidwayAtoll", or something similar.

Go back to Global Mapper. If you have data open, use File > Unload All to close all of the data.

Now open the Midway Atoll data either by clicking the topmost of the choices on the opening page, or by using File > Open Data File(s). Both options take you to the same place.

In the Window that opens, navigate to your MidwayAtoll folder and look for a fairly large .asc file. You may need to adjust the file type to something with ASCII in the name. "Common Supported Elevation Types" also works.

Double click on the midway_atoll_1_3s.asc file. Press OK when it asks you to select a projection and then choose "geographic", which should be the default. Now wait for your data to load. It could take a moment or two.

Save the data to the Global Mapper Native format as shown on the previous page. Be sure to grid it and put it into your MidwayAtoll folder.

If you are concerned about file clutter or disk space, you could delete the zip file and the original .asc data file at this point. You can do this as long as you've saved the data into the Global Mapper format.

Adjusting the Color Scheme (Shader) for Elevation Data

Now it's time to make the data look a little better. The Midway Atoll data has a large range in bathymetry, from sea level down to nearly 4000m. There is little elevation variation above sea level.

The color scheme is edited by choosing and editing the "shaders", found along the menu bar across the top.
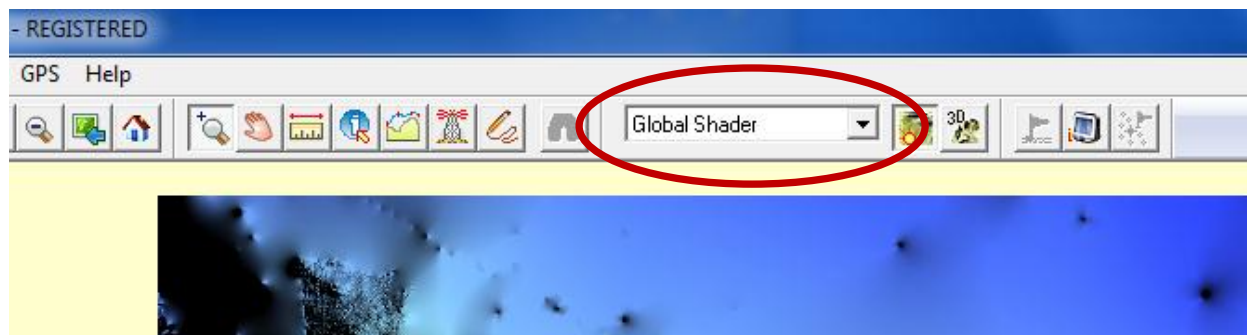
Use the drop-down menu to choose different shaders that come with the program. I don't think any of them look very good. The next section shows how to edit the shader to make it look a little better.

Edit the shader

- Click Tools > Configure…
- In the Configuration window that opens, press the "Shader Options" tab.
- Down near the bottom, in the "Custom Shaders" section, press "New…"
- The "Custom Shader" window should open.
- Give your new shader a name. I tend to use something with my name in it to remember that I made it.
- In the "New Elevation" section, add an elevation to which you would like to assign a color. Start with zero meters, and press "Add".
- In the Color window that opens, choose the top left orangish-pinkish-reddish color and press "OK".
- Press "Add" to add another elevation.
- This time, enter -50 meters, and give it a yellow color.
- Repeat this process until the colors and elevations are similar to the two images at right.
- When done with the Custom Shader window, press "OK".
- In the main Configuration window, press "Apply" or "OK".
- Did anything happen? Nothing? Don't worry.
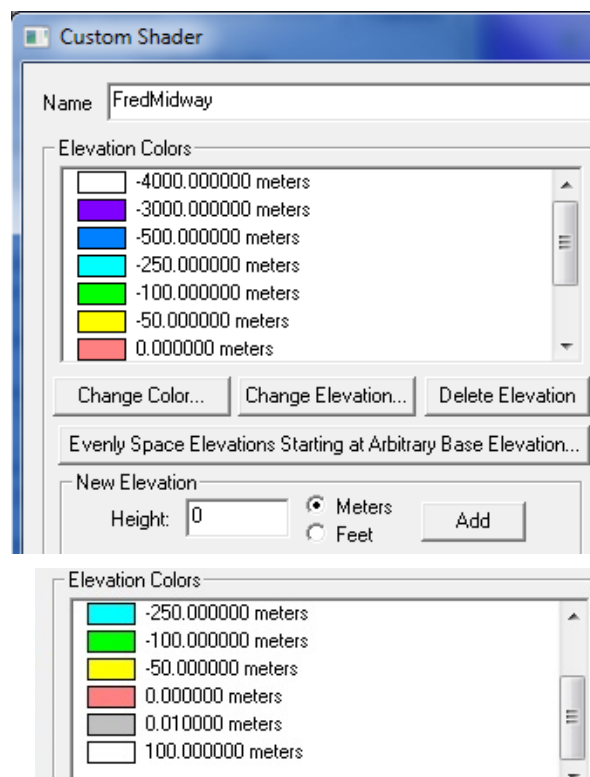
- In that shader pull-down on the main screen toolbar, find the custom shader you just made and select it. Now you should see a difference.

At this point, your map should look something like the image below.
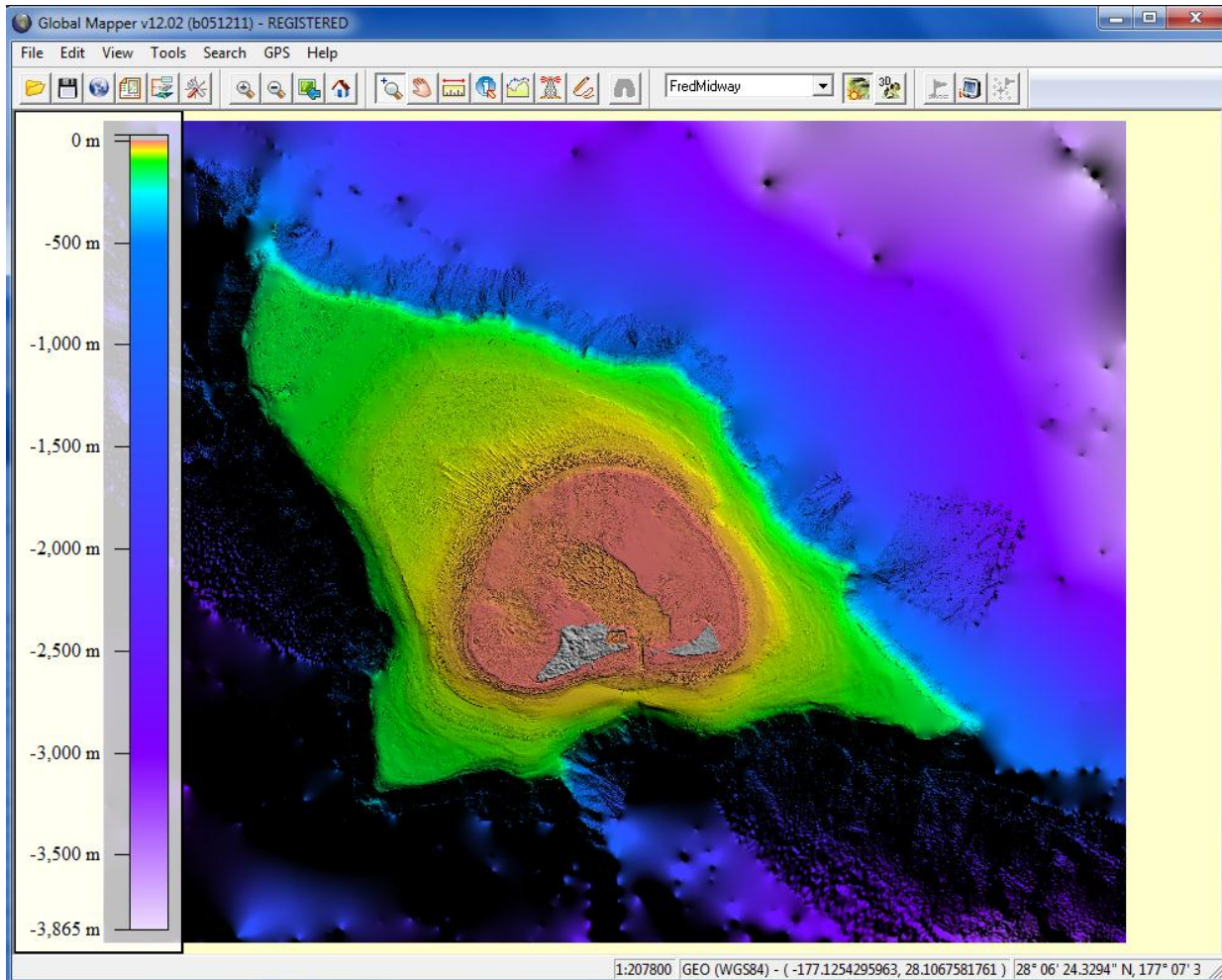
If you don't like the colors or their elevation distribution, go through the editing process until it is pleasing to your eye.

Save your work by either saving the workspace as previously described (quicker), or resaving the data into Global Mapper's native format (File > Export Global Mapper Package File) (slower).

In preparation for preparing this data for MapTiler and exporting to Google Earth, save the data to a TIFF file, by using "File > Export Raster Image Format", and choosing "GeoTIFF". Save the data using the current geographic projection.

In the options window that opens, use all of the defaults. Under the Gridding tab, choose "No Grid". Under the Export bounds tab, choose "All Loaded Data". Press OK, and then choose a file name and the appropriate folder (like where all your other Midway data is). This might take a moment, which is why we chose this small file to work with.

Note: You could also use Global Mapper to export directly to KML/KMZ format, but I have found that this option doesn't work as well as the Map Tiler program.

**MapTiler – Making Tiles for Google Earth**

Open the MapTiler Program. The MapTiler program is just a series of windows; some programs call this a wizard. Press Continue after each selection.

- Selection of the tile profile – choose "Google Earth".
- Source data files -- Press Add, and then navigate to find the TIFF file of your data.
- Spatial reference system (SRS) -- choose WG84 – Latitude and Longitude
- Details about the tile pyramid – go with the default
- Destination folder and address
- Result directory: choose the folder where all the rest of your Midway data has gone
- Destination URL: If you have a server where you can store and access this data, put the URL here (this is very useful).
- Selection of the views – choose Google Earth (KML SuperOverlay); uncheck the others
- Details for generating the viewers – go with the defaults
- Tile rendering – press Render (this might take a few moments).

Go look for the resulting file, which is called doc.kml. Note all the associated folders that were also generated by MapTiler. These hold the .png images that are displayed at various zoom levels.

Open doc.kml, Google Earth. You can change this file name to something a little more descriptive.

In Google Earth, see if you can see the tiles coming into focus as you zoom into the data? One thing you should notice is that the data is not shown at all when the view is zoomed out to a certain degree. Enjoy the fruits of your labor.
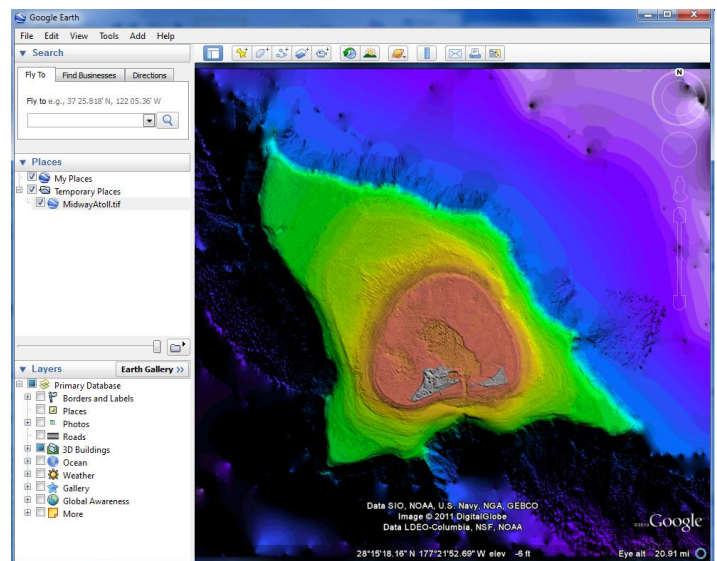
Using what you've learned

Go back to the NOAA Tsunami Inundation DEM website and choose a region that interests you. Go through this process for your region of interest. Pay special attention to the choice of colors for the elevation shader. Adjust the colors to highlight the features you're interested in.

Explore some of the other features of Global Mapper that we haven't had time to delve into here.

A Few More Notes about Global Mapper

Excellent user's manual: http://www.globalmapper.com/helpv9/Help_Main.html

There is a very active forum, where very prompt technical support from Mike (who seems to be the main dude) is dispensed; I've had great luck getting questions answered very quickly: http://www.globalmapperforum.com/forums/forum.php

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