Underway Geophysics Lab Cookbook

USING PICTURE (.PIC) FILES IN WINFROG TO CREATE COASTLINES

WinFrog has the ability to represent various linear features such as shorelines or bathymetric contours by means of loading a "Picture" file. This file is defined by its ".PIC" file type, and is comprised of ASCII, free-formatted, comma-delimited text saved in a WinFrog specific format.

The ".PIC" file consists of three record types:
- **Picture Point Records** to control the "pen up" and "pen down" functions.
- **Picture Control Records** to control the line color and style functions.
- **Picture Text Records** to control the way text is represented.

See the WinFrog User's Guide for exact definitions of the individual data fields.

The data points in these files may be entered manually, read directly from an interfaced digitizer, or obtained by downloading and converting a file from some third party source. One such source is the U.S. Geodetic Survey (U.S.G.S.). The U.S.G.S. provides digitized shoreline and "isobath" information of the U.S. coasts over the Internet free of charge. Isobaths are similar to contours in that they are both lines joining points of equal value. However, isobaths values refer to depth rather than elevation. The isobath information can be rather limited in some areas, but the coastline information is quite comprehensive for the U.S. Mainland.

DOWNLOADING AND CONVERTING FILES FROM THE U.S.G.S

The following notes detail the steps required to download and convert a file from the U.S.G.S. The U.S.G.S. site is found at **http://crusty.er.usgs.gov/rsignell**.html

Coastline (and isobath) information is found in the "**Data**" grouping. You must define the **Geographical Range** for which information is required. Remember that when defining the area this area, west longitudes are entered as negative values. Try to define the limits as well as possible so that unnecessarily large files are not downloaded.
You must also define which USGS **database** to be accessed. The smaller the scale, the better the resolution and larger the file size. For projects working near to shore, select the smaller scale (ie.1:70,000) database to ensure that details appear as true. This, obviously, is not as important for projects working further offshore.

You can define which type of **File Compression**, if any, will be used in conjunction with the file transfer.

The "**Coast Format options**" allow for importation of files straight into supporting software packages such as ArcInfo. For WinFrog, select the "**Mapgen**" option.

Preview the data using the **GMT Plot** option before downloading to ensure that the proper geographical limits were defined. Click on the **SUBMIT** button to proceed to the preview. You may have to wait a moment for the data to be plotted on the display. If the preview is not to your

liking, click on the main menu **Back** button to return to the configuration page. Reconfigure the options as required. If the preview is correct, click on the file name (in blue) beside the line "Here is the coastline data you extracted".

Save the file to the appropriate location on the computer's hard drive. **Do not change the name of the file from the default value.**

The program "Makepic" described below can be configured to create a **.pic** file with a custom name. The downloaded ASCII file is defined by a ".dat" or ".txt" file extension. In order to use this file in WinFrog, this data must be reformatted to WinFrog's .Pic file format using the stand-alone program MAKEPIC. The "MakePic" program works for converting both coastline and isobath data into the WinFrog Picture file format.

MAKING THE DOWNLOADED FILES WINFROG READY

MAKEPIC requires that the downloaded .dat or txt file must be located in the same directory as the MAKEPIC.EXE file.

> Double click on MAKEPIC.EXE to start the program.
> Upon start up, MAKEPIC prompts for the input (*.**dat**) file name.
> Type in the file name and extension. (for example: 21726.dat)
> MAKEPIC prompts for the output (*.**pic**) file name.
> Type in a file name and extension. (for example: taiwan.pic)
> MAKEPIC prompts for a header line of the following form:

2,COAST,7,0,0
This is actually the "Picture Control Record", as mentioned previously. The individual fields are defined as follows: (as per the example given above.)

2 – always a 2 for Picture control records
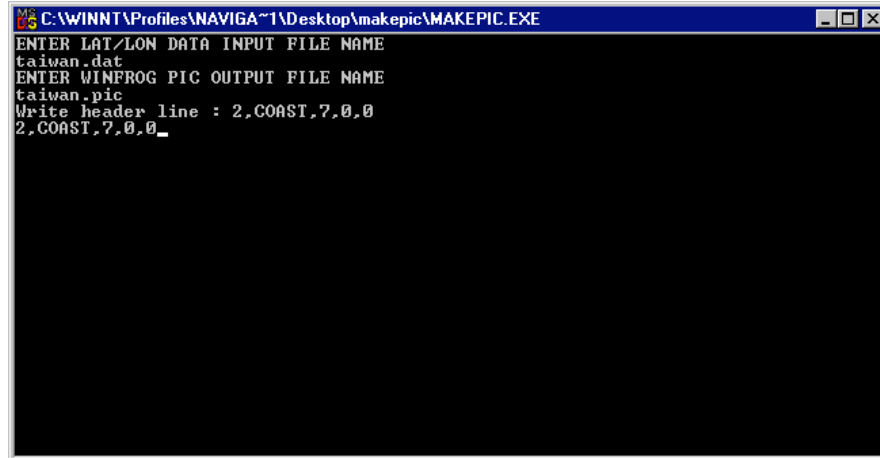
COAST – the name of the picture segment

7 – pen color. This can be changed as to your preference, using the following definitions:

   0= black, 1= red, 2=yellow, 3=green, 4=cyan, 5=blue, 6=magenta, 7=white, 8=gray

0 – **Line style**.0= solid, 1=dashed

0 – reserved for future use.

Type the line: 2, COAST, 7,0,0. Although the original directions say that you can simply hit the enter key for the default Picture Control Record, doing it this way does not insert the record into the file. Make changes to the color and line style as desired.

After running the "MAKEPIC" program, check to see that the newly created .PIC file has a file size greater than 0 to ensure that the conversion worked properly. Delete the "STEP1.dat" file from the same directory that contains the MAKEPIC program. Failure to do so will cause the "MAKEPIC" program to fail in subsequent conversion efforts.
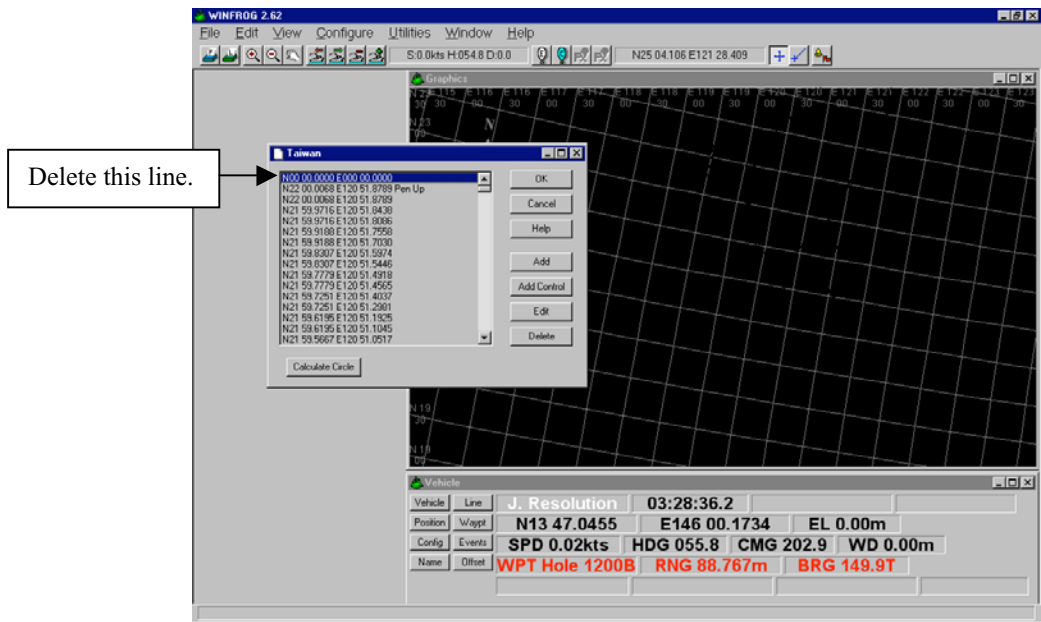
Note: It is critical that you are aware that all data downloaded from the U.S.G.S. site is in units of Latitude and Longitude and refers to the **WGS84 Ellipsoid**. (This is also the same ellipsoid to which the NAD83 datum refers). If the current project refers to some other Datum/Ellipsoid, the picture file is no longer valid. WinFrog assumes that the points are in the working geodetic system. Failure to recognize and adjust for the difference between these data will result in the picture presented being shifted from its true location.

Regardless of which source the data is obtained from, the coordinates must be in degrees and decimal degrees, not degrees and minutes. Mistaking one for the other can create large positional errors. Also note that any changes made to the working geodetics will not be reflected in the coordinates of the points in the picture file. In order to utilize the downloaded picture file with any geodetic system other than WGS84 or NAD83, the operator must first convert the file to that system. The program "GeoCalc" can be used perform the batch conversions required.
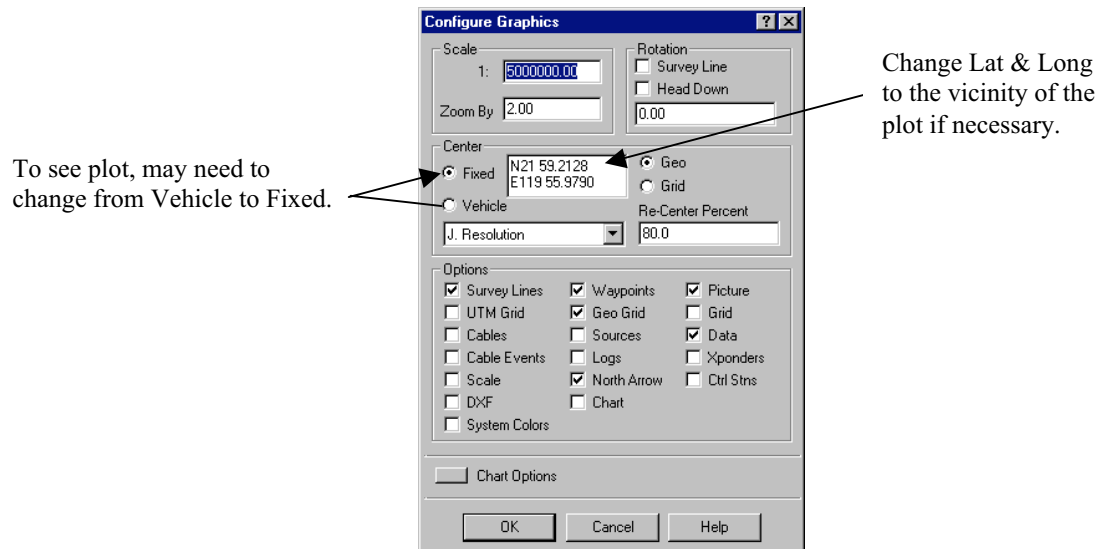
With the file now converted to the .PIC format, you can display this information in WinFrog. You must first make this file the **Working Picture File**. To do this, *select* **File > Select Working Files.** Select the **Picture File** radio button, then *enter* the desired file name and location, or use **Browse** to find the correct file.
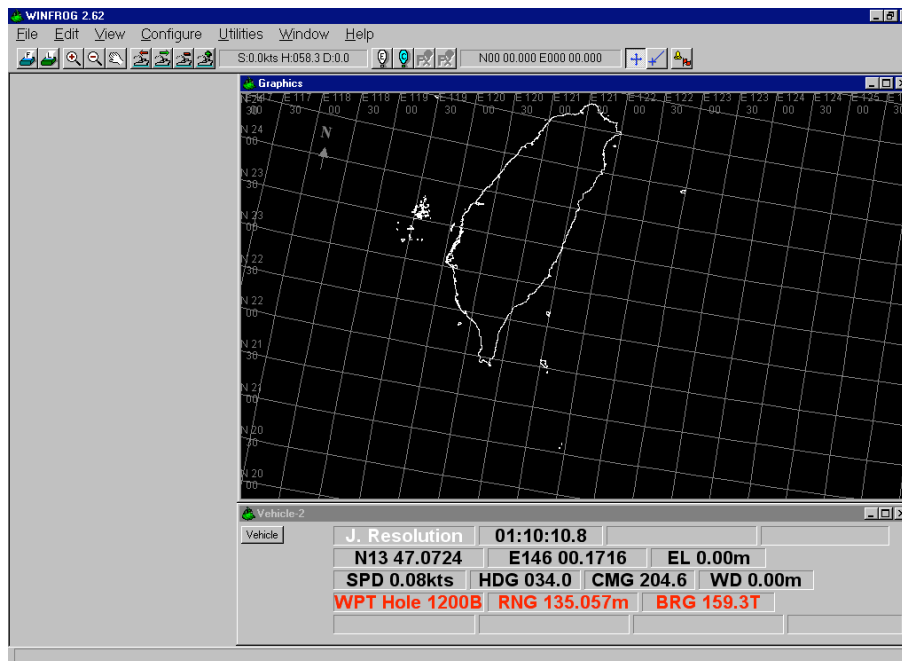
You may need to edit the contents of the **Working Picture File**. Downloaded .PIC files sometimes contain an initial point that has coordinates of 0 degrees Latitude and 0 degrees Longitude. This point should be deleted from the file. Select **File > Working > Picture**.

Delete this line.

You must now *select* **Configure > Graphics** to enable viewing of the picture. Click on Picture in the Options box. If the plot location is not in the vicinity of your current location, you may need change the Center from Vehicle to Fixed and also change the Latitude and Longitude to something close to the location of the plot.

To see plot, may need to change from Vehicle to Fixed.

Change Lat & Long to the vicinity of the plot if necessary.

Note that the contents of the Working Picture File will not be visible if the Graphics display **Background** is the same color as specified when using MAKEPIC.

Example: A plot of Taiwan.

Once the data is properly loaded into WinFrog, you can output a ".DXF" map containing the Picture file data. "DXF" (short for Drawing eXchange Format) is a "universal" file format that allows graphics files to be read by programs such as AutoCad. See the **Output DXF Map** utility for more information.