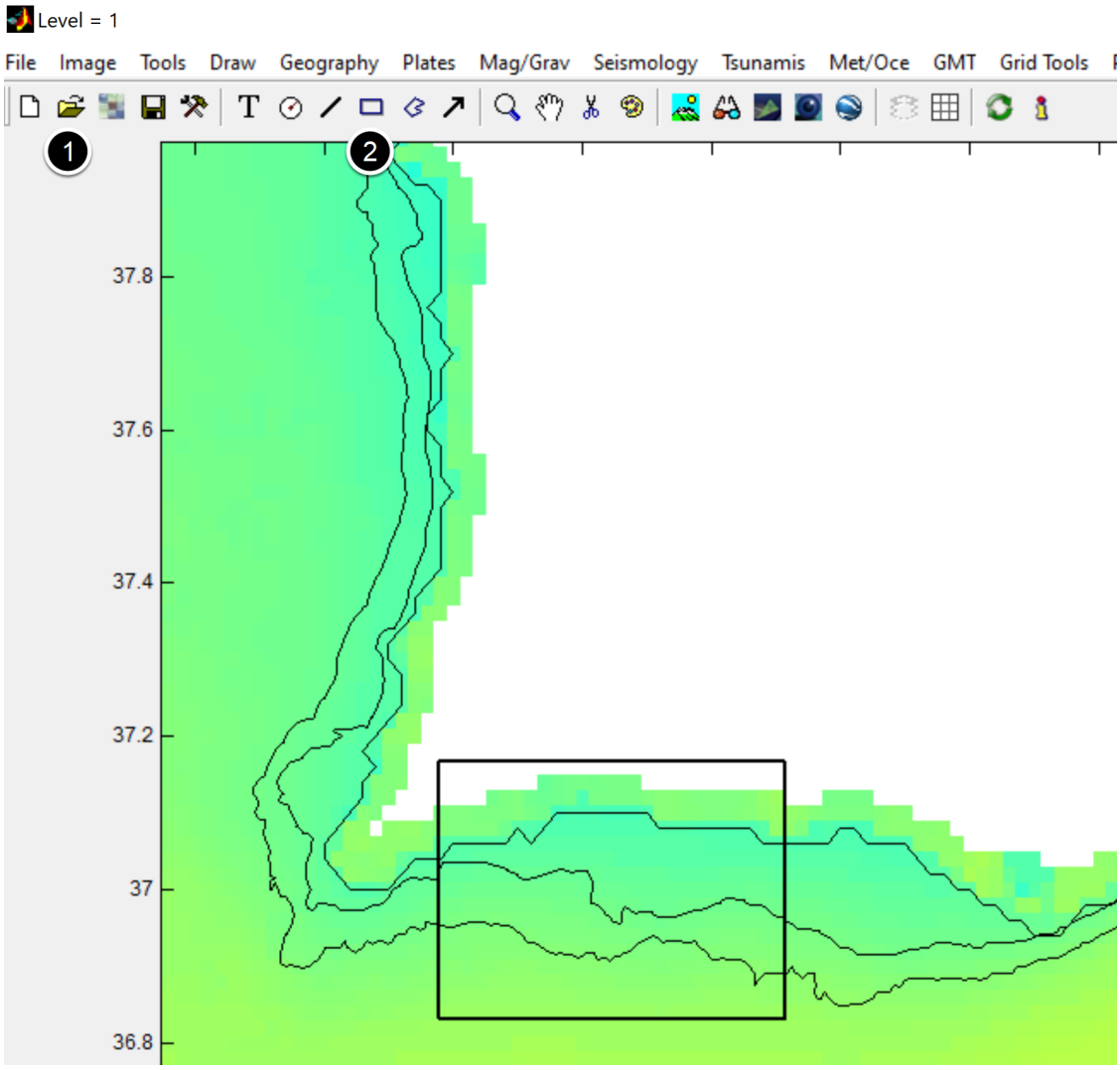
Characterize the average temperature along the coast

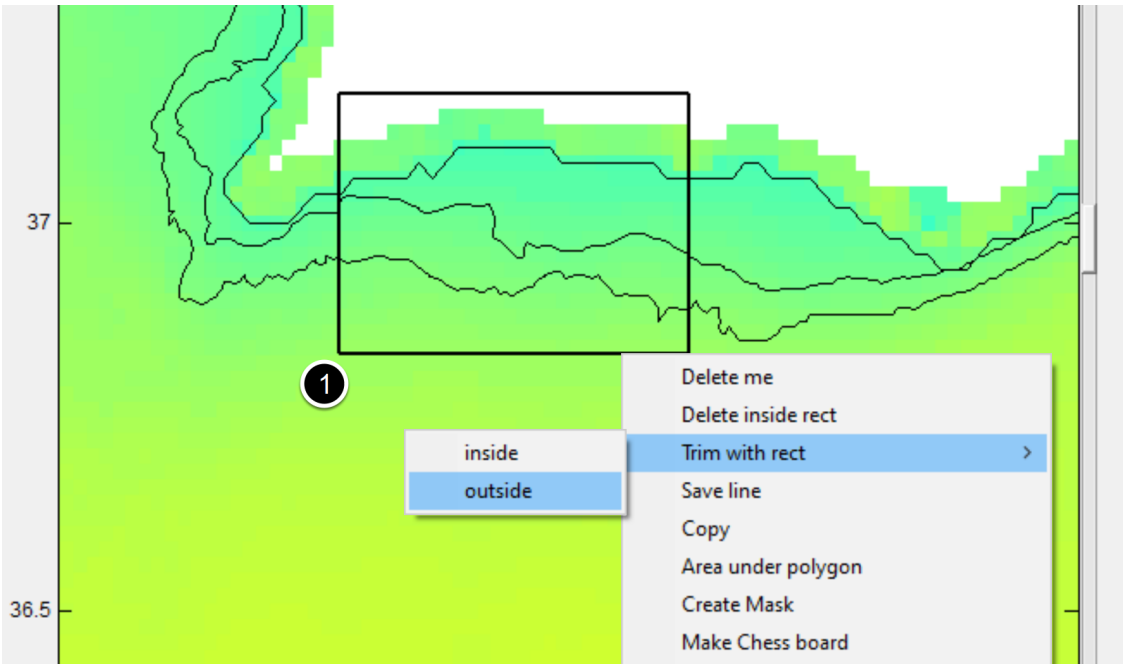
We are going to use here the data with the monthly climatology's calculated in the **Compute month climatological from a stack of SST monthly means** Lesson. We need also to create polygons delimiting the area over which we want to obtain the average temperatures. That area encloses the zone between the coastline and a certain water depth. We will use here the -50 and -100 isobaths to delimit that area.

Prepare the polygons



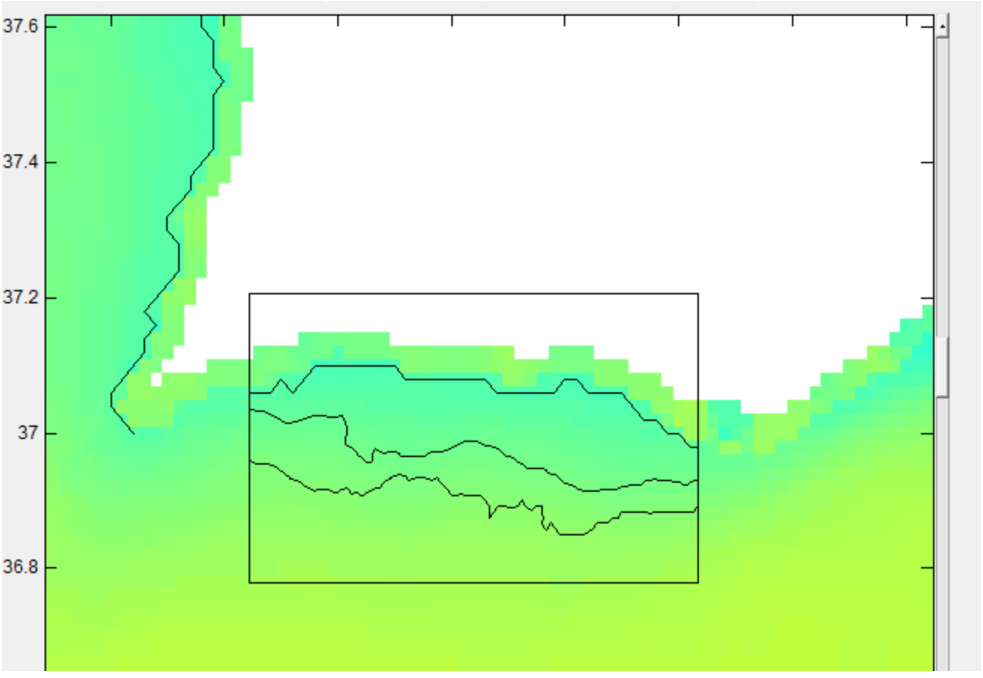
Open the climatology's stack file, and (1) load a file with the contours and (2) draw a rectangle like in the fig above. These lines represent, from continent outward, the coastline approximation and the isobaths of -50 and -100 m respectively.

Trim lines with rectangle



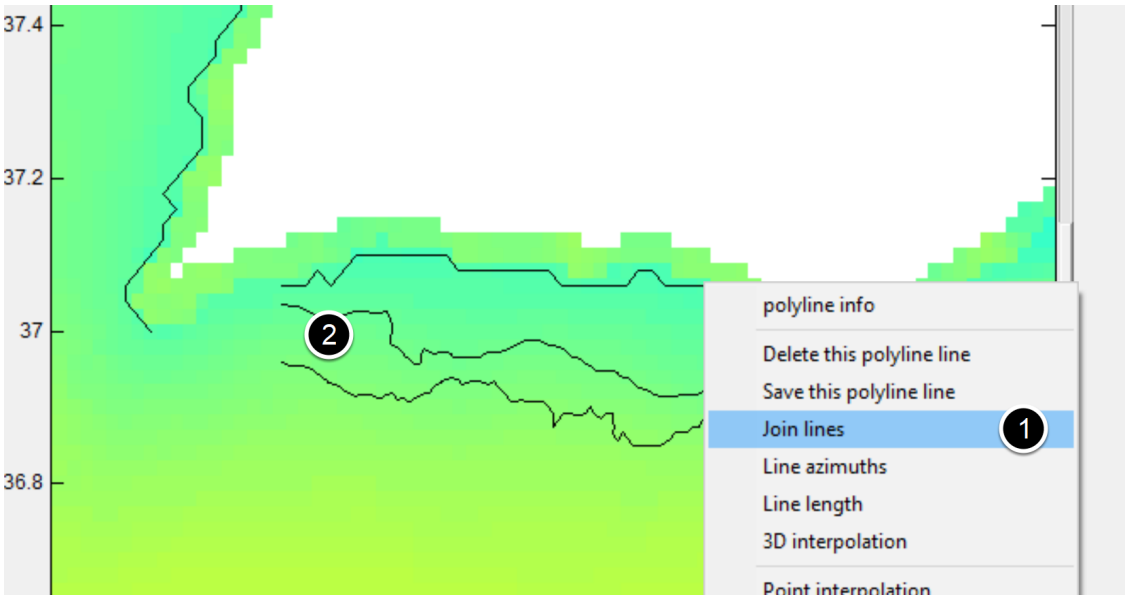
(1) Right-click on the rectangle and select the option shown in figure. Trimming outside means that we will retain only the line segments inside the rectangle.

After trimming



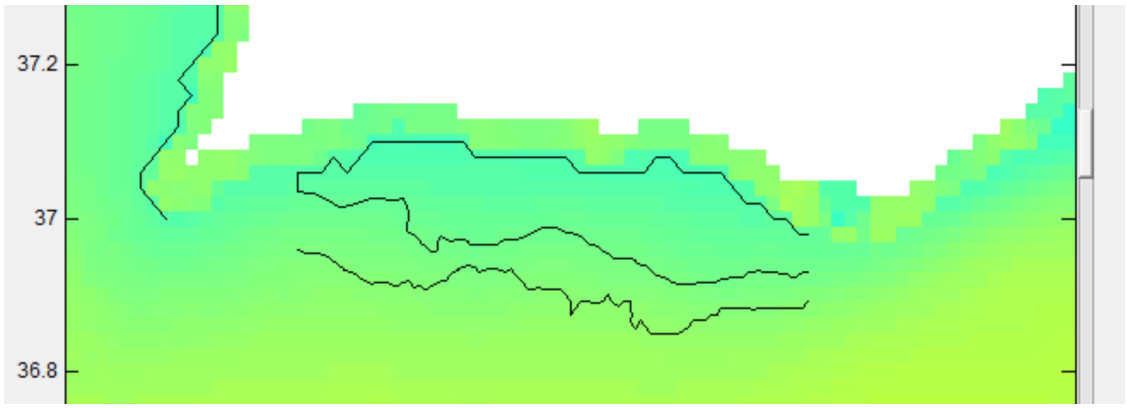
Now delete the rectangle and let's join the coastline and the -50 m isobath in order to obtain a closed polygon.

Making the polygon



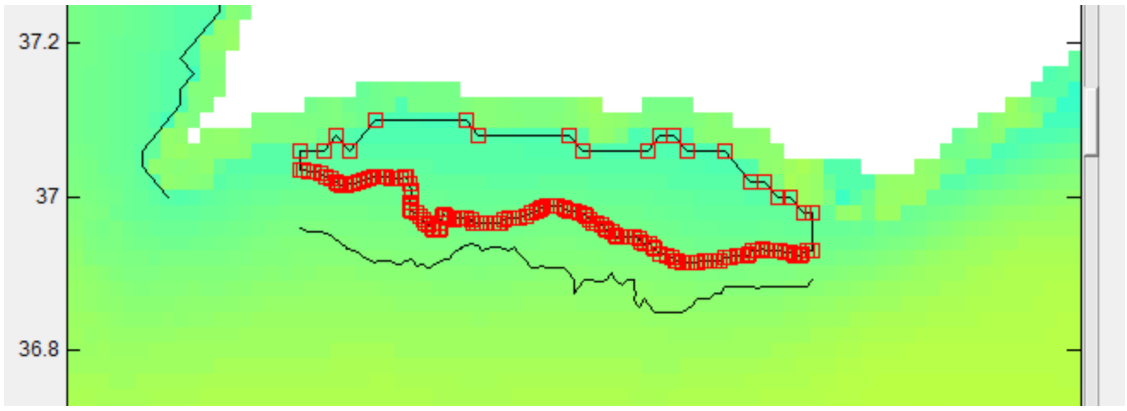
As shown, (1) right-click in the coastline, select "Join lines" and (2) next apply a double left-click on the 50 m line (the middle line).

Closing the polyline



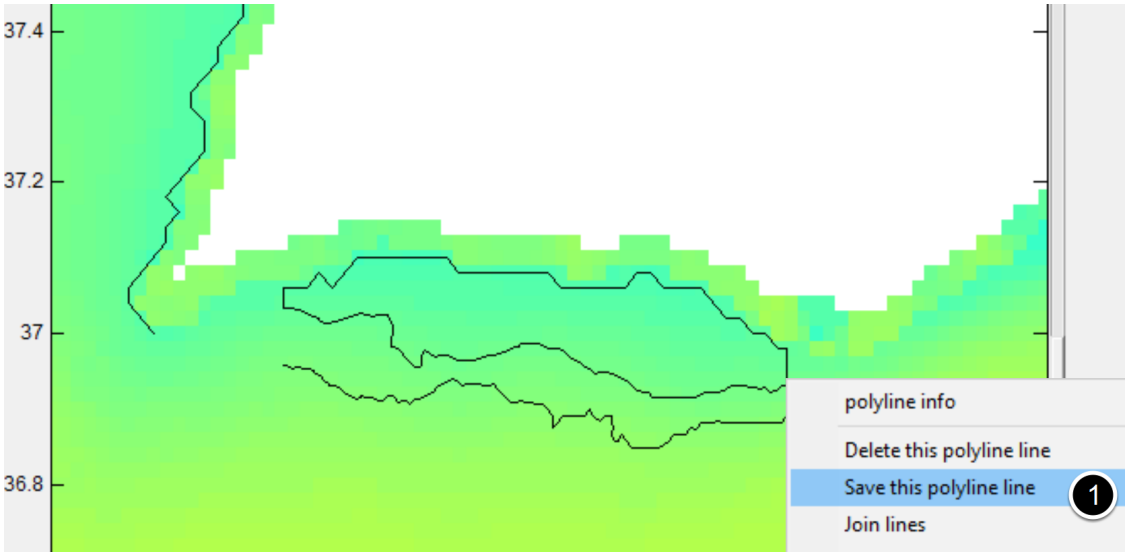
OK, we are nearly done. Only need to close that polyline to get the polygon we want.

Done



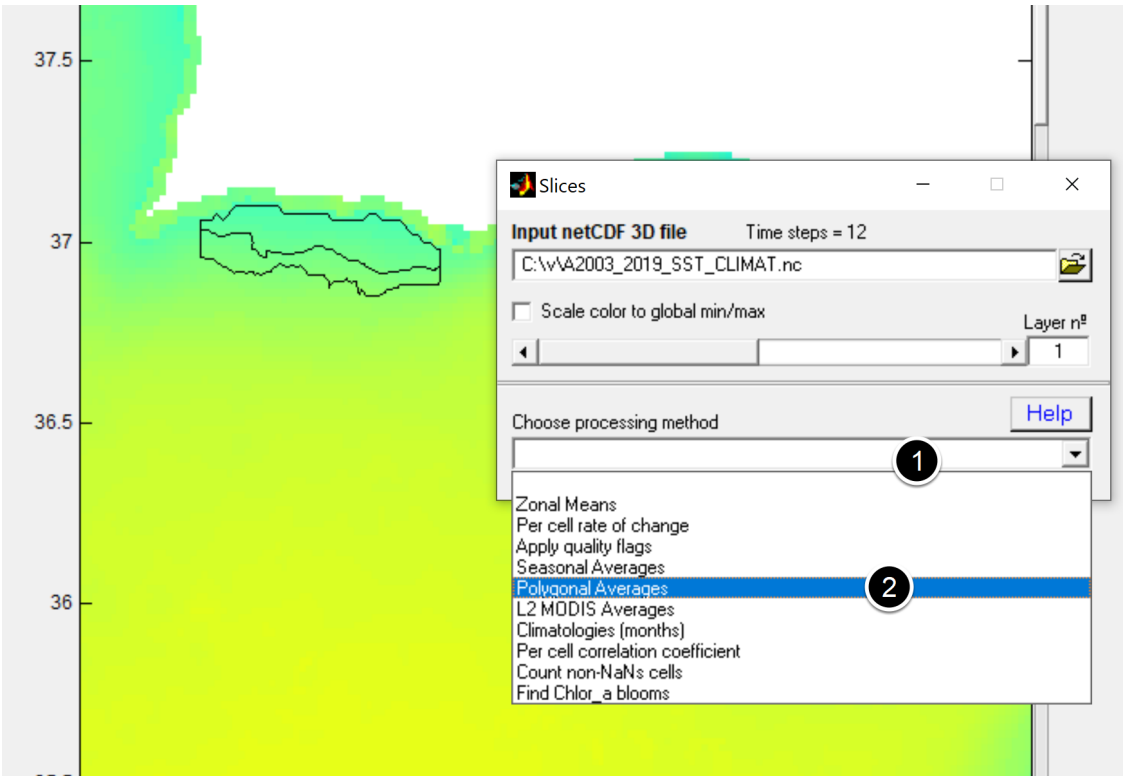
Now, double-click on the polyline to put it in edit mode and hit the keyboard "c" letter ("c" for closing) and we are done. Double-click again to get out of the line edit mode.

Save the polygon



Right-click on the polygon line and select "Save". Now repeat this all procedure and create also a polygon with the -50 and -100 isobaths. After saving the second polygon close everything and open the climatology's stack again and load the two or just the inner polygon (the one from coastline to the -50 isobath). Alternatively, just delete all lines but the inner polygon.

Compute the average temperature inside the polygons



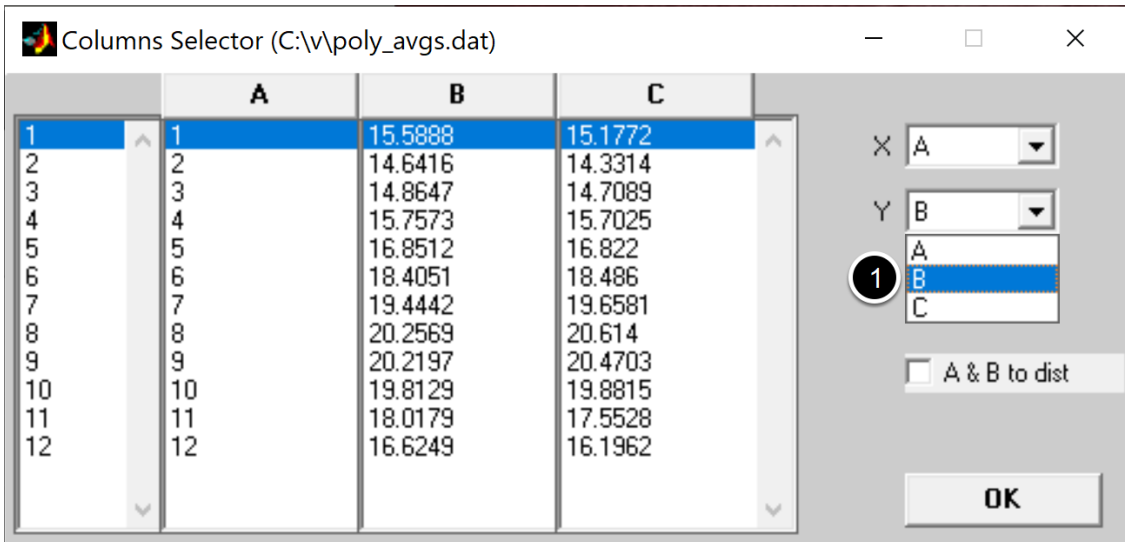
In the processing method (1) select the Polygonal averages option (2). Here the program will calculate as many averages as the number of closed polylines (the polygons). After hitting compute in the (not shown) expansion of the above fig, save the result in disk. The file is a text file that you can open in a text editor and see that it has one column with the month number and as many columns as the number of polygons in the fig.

Example

```
#    -8.37554(X) -8.37084(X)
# T 36.9347(Y)  36.9797(Y)
1.00     15.588816   15.177191
2.00     14.641559   14.331380
3.00     14.864661   14.708855
4.00     15.757330   15.702538
5.00     16.851183   16.822036
6.00     18.405127   18.486009
7.00     19.444243   19.658094
8.00     20.256874   20.614002
9.00     20.219674   20.470308
10.00    19.812941   19.881498
11.00    18.017856   17.552848
12.00    16.624895   16.196164
```

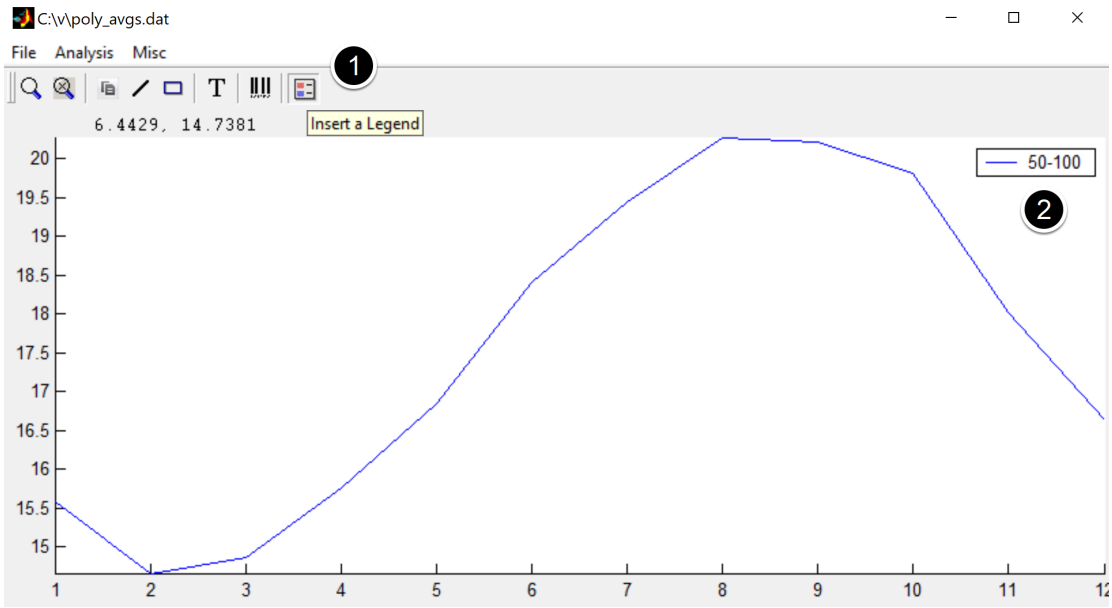
Example when we calculated over two areas (two polygons). First column is the month number, and the other two represent the average temperature inside each of the polygon. Now the question is, which column is which? To answer that we have to look at the first two rows of the file.

They contain the coordinates of the polygon's centroid. We can display the data in this file with a program at choice, but I'll show how to do it Mirone.



From a Mirone window select "Tools -> X,Y grapher". From the window that opens select "File -> open". Load the file with the polygonal averages obtained above and, if that file has data over more than one polygon (i.e. more than 2 columns), you will see another window to select which column to load. Like the figure above. By default it loads the first column but we can select other columns as shown in (1). Hit return

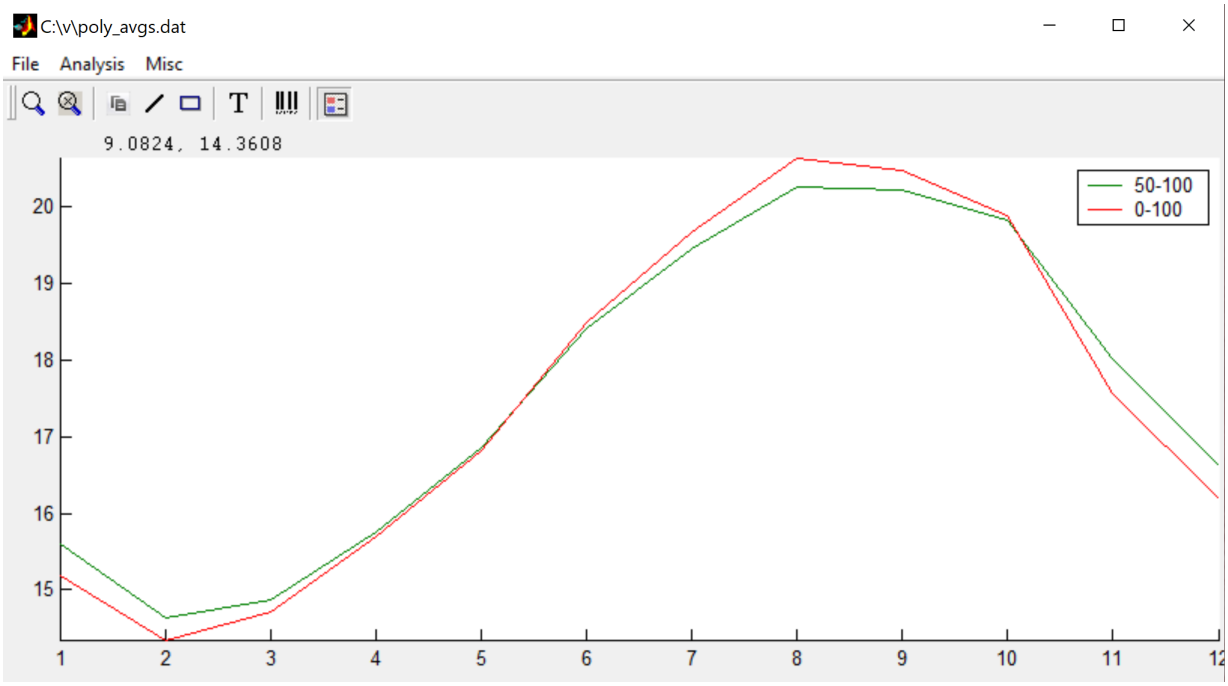
The 12 average temperatures (climatologies) averaged over the polygon area



This figure represents the average temperature (in itself already an average because it is a climatology) in this case between the -50 and -100 meters because the second polygonal average comes first in the file and we load only one. Repeat the loading process shown in

previous step and select the data of the other sector (i.e. "C" in columns list).

Temperatures in both sectors



And that's it. We have now the temperatures that are most likely to find when we go to beach at the location where the polygons were drawn.