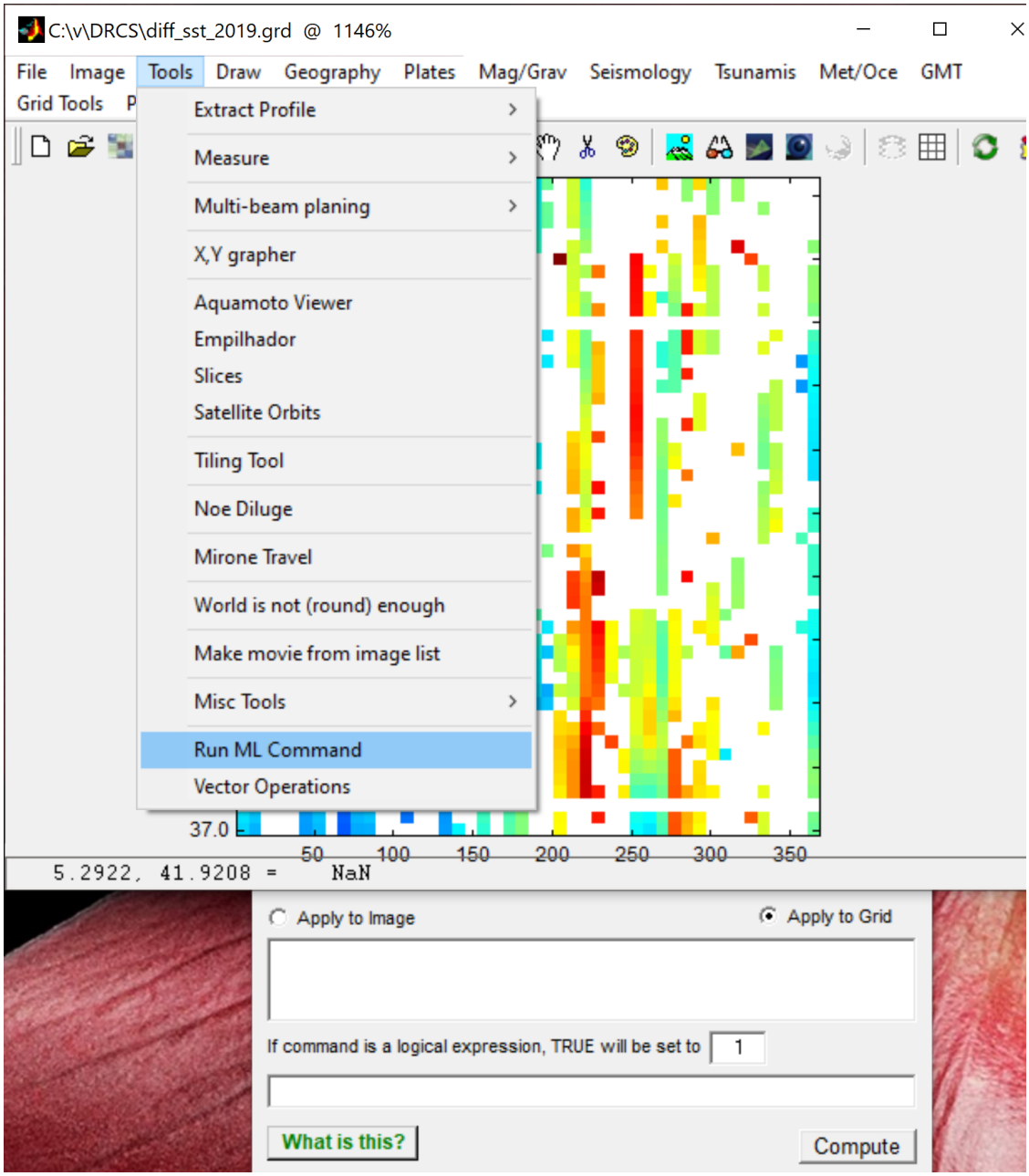
Detecting upwelling events III

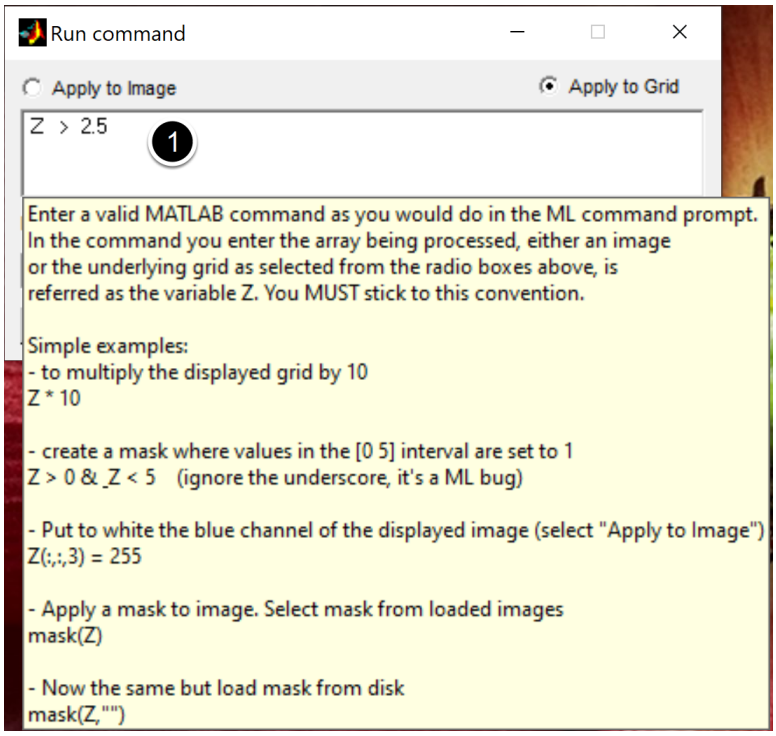
Explore the grid with the SST differences obtained in Lesson **Detecting upwelling events II**

Step 1: Open the a Matlab command tool



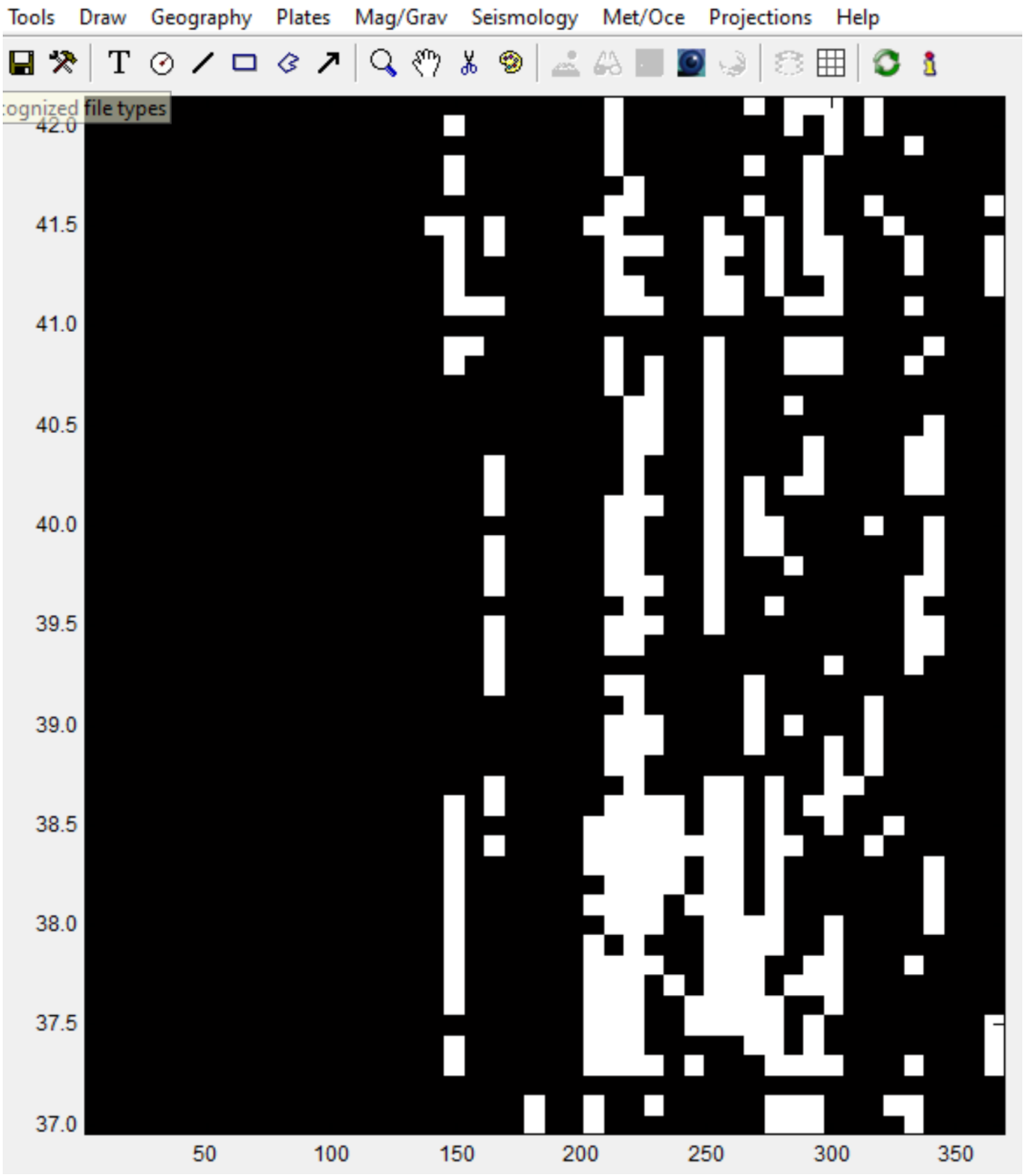
Do as in the image to call a basic command tool. It is basic because it understand only a limited set of Matlab commands (i.e. commands using the Matlab language) but enough for what we need to do here.

Step 2: Compute mask with upwelling events



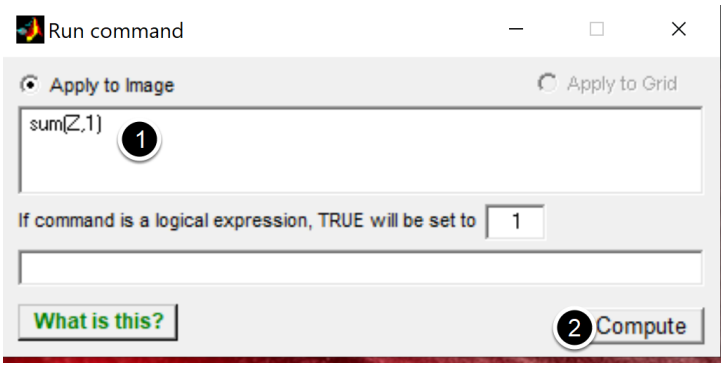
In the edit box enter the instruction shown in (1). The yellow text is a toooltip of what type of commands can be entered in this box. The **Z > 2.5** command can be seen as asking the question to all grid nodes. *Are you larger than 2.5?* If the answer is yes that node is assigned the value 1 (true), otherwise 0 (false). The result is displayed in next figure

Step 3: Mask with values where temperature difference is larger than 2.5 degrees



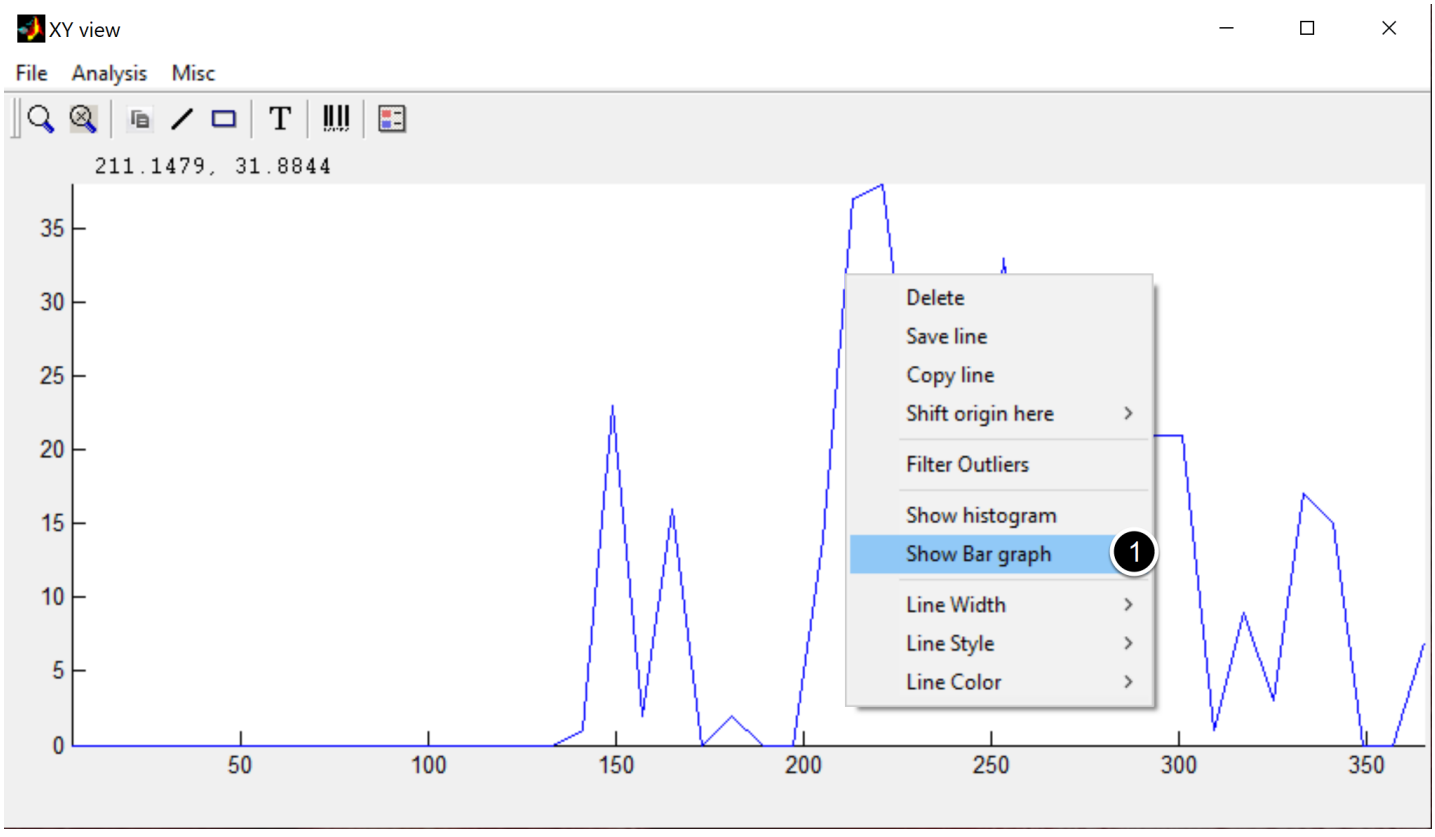
White pixels represent locations where temperature difference is larger than 2.5 degrees. Remember that *YY* axis represent latitude along the west coast ad *XX* the number os days along the year

Step 4: Get distribution in function of time



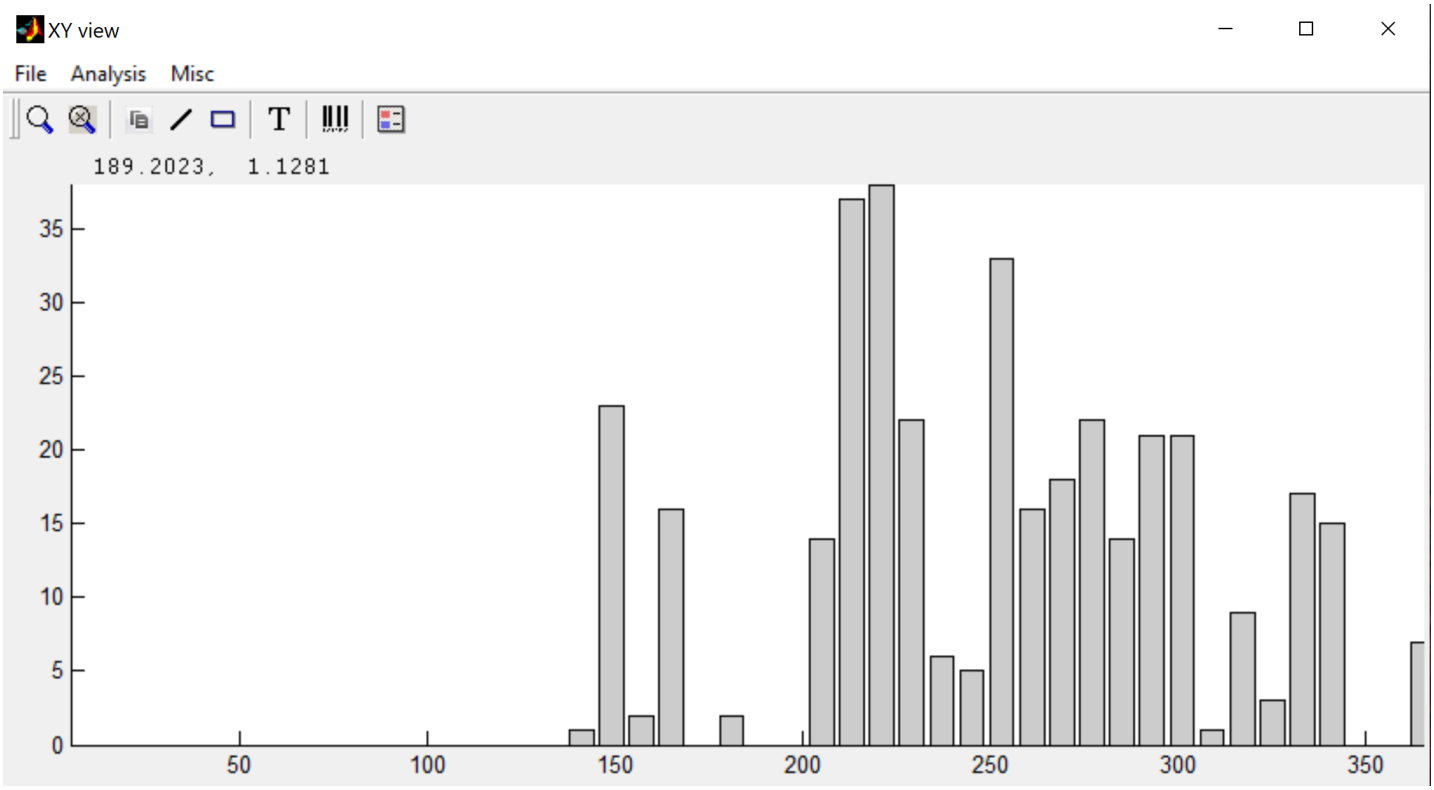
Enter the command in (1). In Matlab the first dimension of a matrix is columns and the second, the rows. So, **sum(Z,1)**, sum the nodes of the *Z* matrix along the columns and what we get is a 1D vector with the counting in function of time. This is what we see in next figure.

Step 5: Number of events distributed along the year



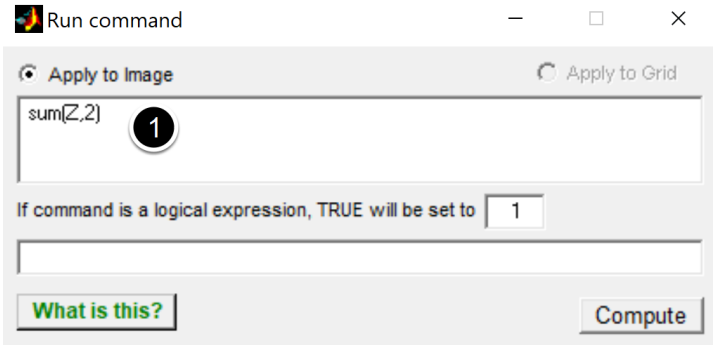
We can either display the counting as line or, if by right-clicking on the line and select option (1), as a bar graph as shown in next figure.

Step 6: Seen as a bar plot



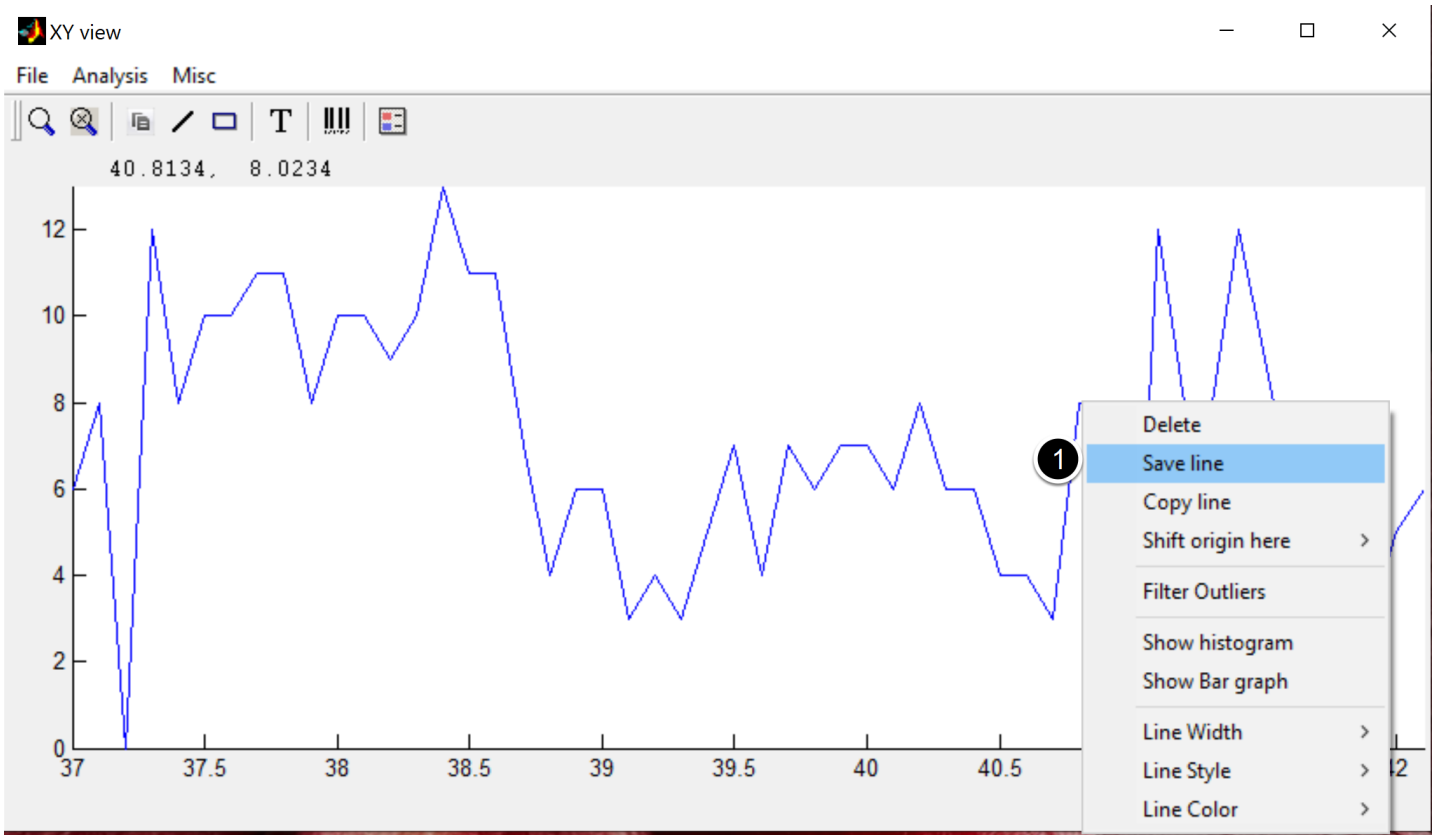
We can see here that upwelling season for the year 2019 started only about day 150 and was more intense between days 200 and 300.

Step 7: Compute number of events in function of latitude



Now repeat **Step 4** and enter **sum(Z,2)**. Now we are adding along the rows of the *Z* matrix, so the result shows the counting along the *YY*, which is the latitude

Step 8: Number of events distributed along the coast



Also do like in (1) to save counting data in a file. Call it *upwells_lat_2019.dat*. What we see here is that southern latitudes display a higher number of upwelling events for the year under analysis (2019)