

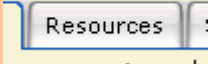
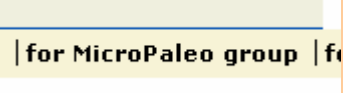
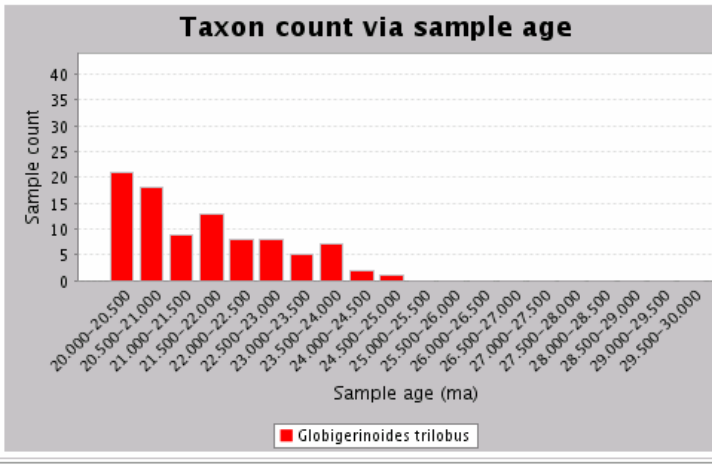
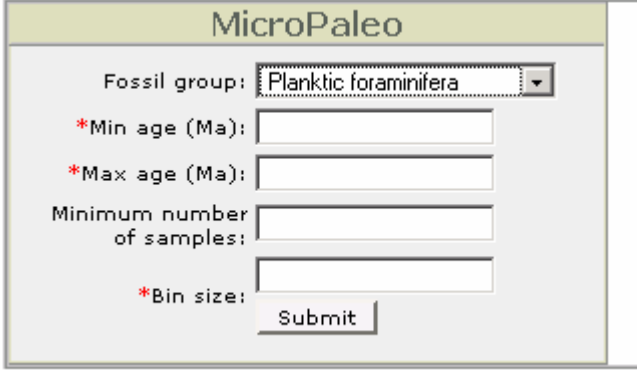


Directions for using the MicroPaleo tool on the CHRONOS Website.

<p>Go to the CHRONOS website at http://www.chronos.org/</p>																																											
<p>Choose the Tool and Data Portal. Click on it.</p>																																											
<p>Click on the "Resources" tab.</p>																																											
<p>On a toolbar right below the Resources, tab, choose "For MicroPaleo Group"</p>																																											
<p>The MicroPaleo search tool shows data about the tiny microfossils found in deep-sea cores. This tool will produce a set of bar graphs, one bar graph for each species that lived during the chosen range of time. The program reads data from the CHRONOS Neptune database and displays the results in bar charts. A sample bar chart is shown here - this is the type of chart you will be making.</p>	 <table border="1"> <caption>Taxon count via sample age (Globigerinoides trilobus)</caption> <thead> <tr> <th>Sample age (ma)</th> <th>Sample count</th> </tr> </thead> <tbody> <tr><td>20,000-20,500</td><td>21</td></tr> <tr><td>20,500-21,000</td><td>18</td></tr> <tr><td>21,000-21,500</td><td>9</td></tr> <tr><td>21,500-22,000</td><td>13</td></tr> <tr><td>22,000-22,500</td><td>8</td></tr> <tr><td>22,500-23,000</td><td>8</td></tr> <tr><td>23,000-23,500</td><td>5</td></tr> <tr><td>23,500-24,000</td><td>7</td></tr> <tr><td>24,000-24,500</td><td>2</td></tr> <tr><td>24,500-25,000</td><td>1</td></tr> <tr><td>25,000-25,500</td><td>0</td></tr> <tr><td>25,500-26,000</td><td>0</td></tr> <tr><td>26,000-26,500</td><td>0</td></tr> <tr><td>26,500-27,000</td><td>0</td></tr> <tr><td>27,000-27,500</td><td>0</td></tr> <tr><td>27,500-28,000</td><td>0</td></tr> <tr><td>28,000-28,500</td><td>0</td></tr> <tr><td>28,500-29,000</td><td>0</td></tr> <tr><td>29,000-29,500</td><td>0</td></tr> <tr><td>29,500-30,000</td><td>0</td></tr> </tbody> </table>	Sample age (ma)	Sample count	20,000-20,500	21	20,500-21,000	18	21,000-21,500	9	21,500-22,000	13	22,000-22,500	8	22,500-23,000	8	23,000-23,500	5	23,500-24,000	7	24,000-24,500	2	24,500-25,000	1	25,000-25,500	0	25,500-26,000	0	26,000-26,500	0	26,500-27,000	0	27,000-27,500	0	27,500-28,000	0	28,000-28,500	0	28,500-29,000	0	29,000-29,500	0	29,500-30,000	0
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<p>To retrieve data from the Neptune database of deep-sea core information, you will need to fill in the boxes on the bottom left side of this page. A picture of this form is shown here.</p>																																											

The top slot to be filled in has a dropdown menu that shows the four main groups of microfossils. You will need to make bar graphs for each of the four groups. Choose one group as the first group. In this example, we are choosing the Planktic foraminifera group.

MicroPaleo

Fossil group: (dropdown menu open showing: Planktic foraminifera, Diatoms, Calcareous nanoplankton, Radiolarians)

*Min age (Ma):

*Max age (Ma):

Minimum number of samples:

*Bin size:

Submit

Now it is time to choose a ten million year time span. The most recent endpoint of this time span (the minimum age) is put in the next blank. Express this endpoint in millions of years ago: Ma. In this example, we are choosing 20 Ma, so we write in "20." For this project, you should restrict your choices to somewhere in the 30-70 million year range.

MicroPaleo

Fossil group:

*Min age (Ma):

*Max age (Ma):

Minimum number of samples:

*Bin size:

Submit

Then choose the more distant endpoint of the ten million year time span (the maximum age). This the also expressed in millions of years ago. In this example, we are choosing 30 Ma, so we write "30" in the blank.

MicroPaleo

Fossil group:

*Min age (Ma):

*Max age (Ma):

Minimum number of samples:

*Bin size:

Submit

The next blank asks for the minimum number of samples needed for the tool to make a bar graph. Setting the number higher than 1 (choosing, perhaps 10 or 20) will keep the tool from producing a lot of graphs with so little data that they are not very useful. You can experiment with different values here. In this example, we will use 20.

MicroPaleo

Fossil group:

*Min age (Ma):

*Max age (Ma):

Minimum number of samples:

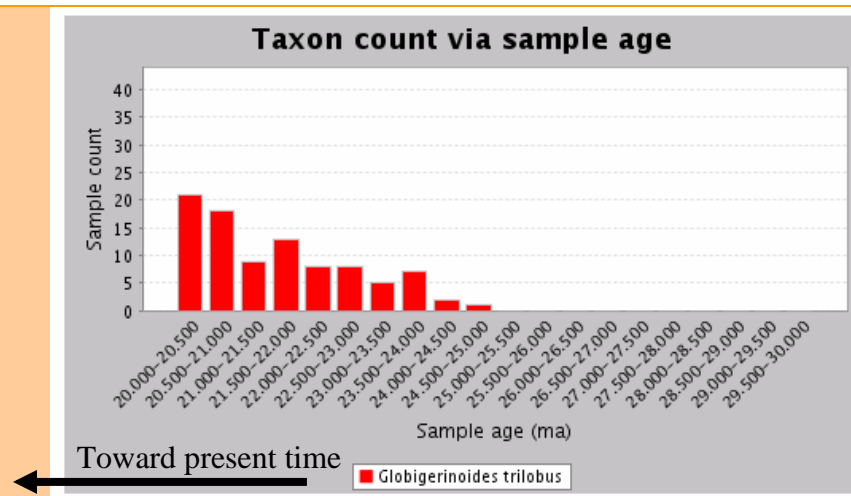
*Bin size:

Submit

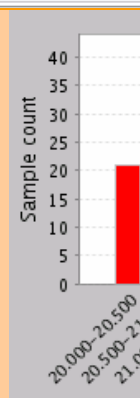
The final blank requires you to choose a bin size. This "bin size" is the size of the unit of time being used on the horizontal axis of the bar graph. Choose either 0.5 million years or 1 million year. In our example, we have chosen half million years as the bin size.

Then press the "Submit" button to make the set of bar graphs.

A large set of bar charts was made when the submit button was pressed. After a few seconds of computing, these are displayed in a long list that can be viewed by scrolling down. Let's look at one bar chart to determine what it shows.



The vertical axis on the left shows the "sample count." This is the number of drill cores from around the world that contain this species of fossil at the each specific number of millions of years ago. The first red bar is indicating that during the half million year range from twenty to twenty-point-five million years ago, there are slightly more than 20, probably 21, samples that contain this species of foraminifera.



Near the bottom of the chart is the name of the genus and species of microfossil to which the graphed data refer. In this case, the microfossil is *Globigerinoides trilobus*.

Globigerinoides trilobus

This example chart shows that the first occurrence of this species was during the time range of 24.5 to 25 million years ago. **For our purposes, we will report the first number of this range as the time for a bar on a graph.**

