

The Macroinvertebrate biotic index is given by the formula:

$$MBI = \sum T_v \div \sum N$$

Where T_v = number of individuals x pollution tolerance rating

The pollution tolerance rating of some representative organisms is given below. The higher the value, the more tolerant the individual. The third column shows some sample data.

Organism	Pollution tolerance rating (L ₁)	Number found at a certain site (L ₂)
Stonefly	1.5	5
Caddis fly	3.5	1
Mayfly	3.0	4
Scud	4.0	35
Midges	6.0	25

http://www.cod.edu/people/faculty/chenpe/RiverWatch/MBI_calculator.html

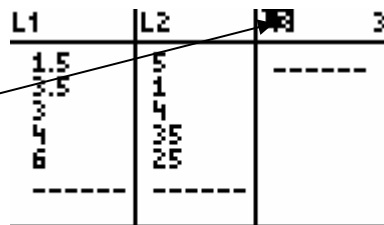
The data in the columns can be entered into lists. Once in the lists, spreadsheet functions can be carried out.

Press the **STAT** button. Note the black highlight covers the word Edit. Press enter.



Enter the pollution tolerance rating into L₁. Do this by entering 1.5 and then 'enter'; 3.5 and then enter etc.

Use the right scroll button to move over to column L₂ and enter the number found at the site into that column.

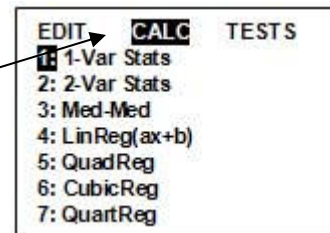


To multiply the two columns, scroll over to L₃ and up so that the term L₃ is highlighted.

You want to make the third column (L₃) equal to L₂xL₁. To do this, type the blue **2nd** button in the top-left corner and then type '1' and then 'x' and then **2nd** again followed by '2'. Press enter. Note the equation appears at the bottom of the screen.



To determine the $\sum T_v \div \sum N$, you will need first the sum of column L₃ and then the sum of L₂. To do this, push **STAT**. Scroll over so that **CALC** and 1-Var Stats are highlighted.



Press enter. Press **2nd** '2' so that the screen says 1-Var Stats L₂. Press enter. Note that the $\sum x = 70$. Repeat for L₃. Note that the $\sum x = 313$. Thus

$$\sum T_v \div \sum N = 313 \div 70 = 4.5$$

Which is a water quality which borders on very good.

Table 6.2. Water quality based on Family Biotic Index (adapted from Hilsenhoff, 1977).

Biotic Index	Water quality	Degree of organic pollution
0.00–3.50	Excellent	No apparent organic pollution
3.51–4.50	Very good	Possible slight organic pollution
4.51–5.50	Good	Some organic pollution
5.51–6.50	Fair	Fairly significant organic pollution
6.51–7.50	Fairly poor	Significant organic pollution
7.51–8.50	Poor	Very significant organic pollution
8.51–10.0	Very poor	Severe organic pollution

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8.51–10.0	Very poor	Severe organic pollution