

Error Bars on Excel

Name:

Date:

1. Enter Data and Calculate Averages
 = AVERAGE (drag mouse over raw data)

2. Calculate Standard Deviation
 =STDEV(drag mouse over raw data)

4. Add Chart Element
 → Error Bars →
 More error bar options
 (or Format Error Bars)

3. Highlight Averages and Insert Chart

6. Enter ALL Standard Deviation values for BOTH Positive and Negative Error values

5. Custom [Specify Value]

Error Bars

Any good experimental design must have **replicates** – the process of repeating an action many times. For example, if measuring hard coral cover using a transect, use more than one transect! With everything else kept the same, in a perfect world, all replicates ‘*should*’ *technically* yield the same result. And, any differences between replicates would indicate some sort of ‘error’. Notably, marine environments are highly variable. Therefore, it is not unusual to have some margin of error between replicates. For example, where two replicates (i.e. transects) *should technically* yield the same result, one replicate is slightly different to the other. When this happens, it is important to communicate to your audience exactly how different they were to each other. For example, if the replicates were only a little different to each other, the error bar will be small. Likewise, if the replicates were very different to each other, the error bar will be large. The size of the error bars communicates the **reliability** of your investigation.

Importantly, error bars are only used on charts that have graphed the ‘averages’ (not raw data). Error bars are commonly calculated using **standard deviation**. Therefore, you need to calculate the standard deviation of your raw data beforehand (see formula in Step 2 above). Once you reach Step 6 (and you are ready to enter the positive and negative values into the Custom Error box) all you have to do is highlight the standard deviation values in your excel spreadsheet, and enter that highlighted data for BOTH the positive AND negative error value inputs.