Graphing Guide

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September 16, 2009

Introduction Graphical presentations are often the best way to show complex relationships within data. Effective graphs efficiently and clearly present lots of information. Poorly constructed graphs, at best do the opposite. The following guidelines fall into two categories: 1) Graphing Laws – these are rules or standards that are never to be violated. 2) Scientific Graphing Standards – these are the most common conventions of graph making in the biological sciences and may differ by discipline.

Graphing Laws

1. Label all axes clearly and include units when relevant.
2. Include a figure legend that provides a brief explanation of the data being presented and explains all symbols in the graph.
3. Choose appropriate numerical scales for axes.
4. Only add features to a graph that convey information (e.g., if a column has 3 dimensions then the depth should mean something!)
5. Display dependent variables on the y (vertical) axis and independent variables on the x (horizontal) axis.
6. Only connect points when the data indicate a relationship between them.
7. Make graphs as simple as possible (i.e., avoid complicated symbols and icons... I'm looking at you USA Today!).
8. When plotting means always include error bars indicating the within variation around the mean.

Scientific Graphing Standards

1. Display only the x and y axes with no other grid lines.

2. Show the relationship between continuous and categorical data in a bar graph (good) or box–plot (better but hard to do in Excel).

3. Show the relationship between two groups of continuous data in a scatterplot (not a line graph!).

Example of a graph that follows the graphing laws and standards:

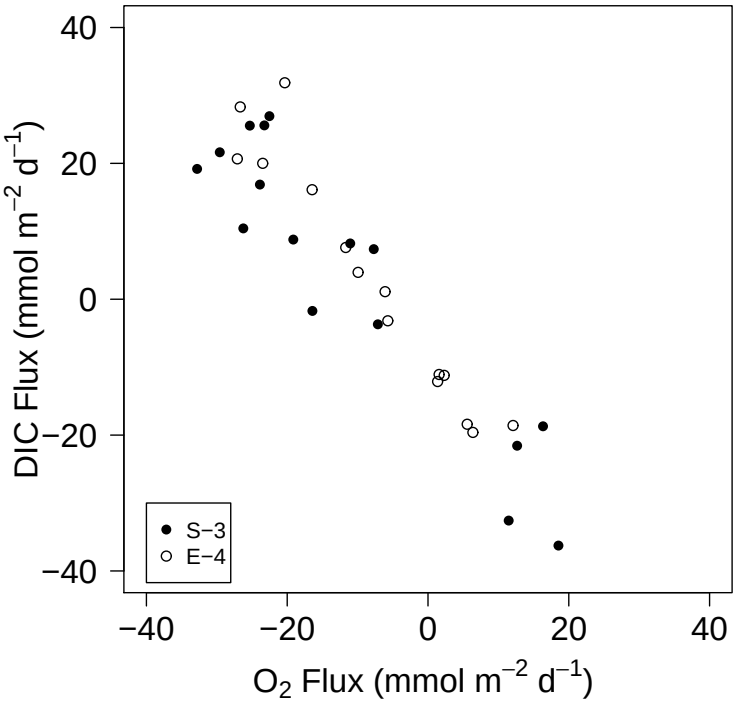

Figure Legend – Simultaneously determined O_2 and dissolved inorganic carbon (DIC) flux in cores during the light availability experiment. Each point represents the flux form one core.