Statistics Civic Engagement Project
University of Minnesota, Morris
2004-05

Creating a graph with Excel—Step by Step Instructions

1) By now, you've already chosen your data and are on to step #2 of the overall statistics civic engagement project. The first thing to do is to know what you are reporting on and create an appropriate graph. For this example, we will compare the percentage of land that is forested in St. Louis County, Stevens County, and the average for the state of Minnesota, as reported on the Datanet web site (Minnesota Land Use and Cover Statistics—your source would be 1990s Census of the Land). Enter the data into Excel with approximately this format:

	St. Louis	Stevens	MN
% forested	51.4	2.3	26.7

2) You are now ready to create a simple graph. Select all of the boxes you placed your data in (for this example, you would select all of the boxes shown in the chart because Excel only allows you to select rectangular regions), and click on the "Chart Wizard" box in the top toolbar. (It has a tiny multicolored column style graph as its symbol.) This will give you a window which will direct you step-by-step through basic graph creation. You can choose bar graphs, pie charts, line graphs, and so on—usually, one of the very basic forms will be ideal; don't use 3-D effects. Because this data is a comparison, a pie chart wouldn't be very useful, and because there is no change over a time period, a line-style graph wouldn't be very accurate, either, so we'll use a column style graph. (A horizontal bar graph would also be fine.)

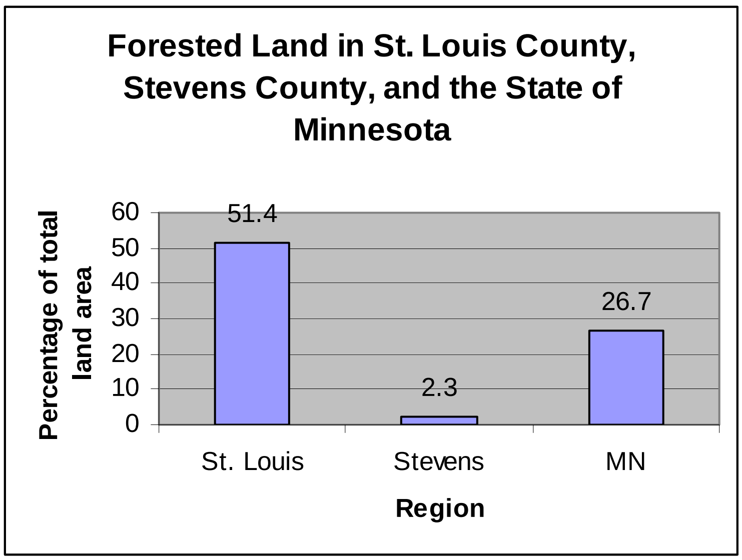
3) The next prompt from the "Wizard" (Step 2 of 4) will be for your data series. If you've already selected your data on the sheet (there will be a moving, dashed line around the selected region), these values are already entered for you. You can choose how you want your data to be read—by rows or by columns (in other words, how the values are assigned). In this example, we selected "rows," which is the default setting. Click "next" if your data appears to be displaying properly on the tiny sample graph.

4) Next, you will be given a whole range of options for your graph (Step 3 of 4—Chart Options). You will be able to change many aspects of the graph later, but taking some time here now will save you later. Moving from left to right for our example:

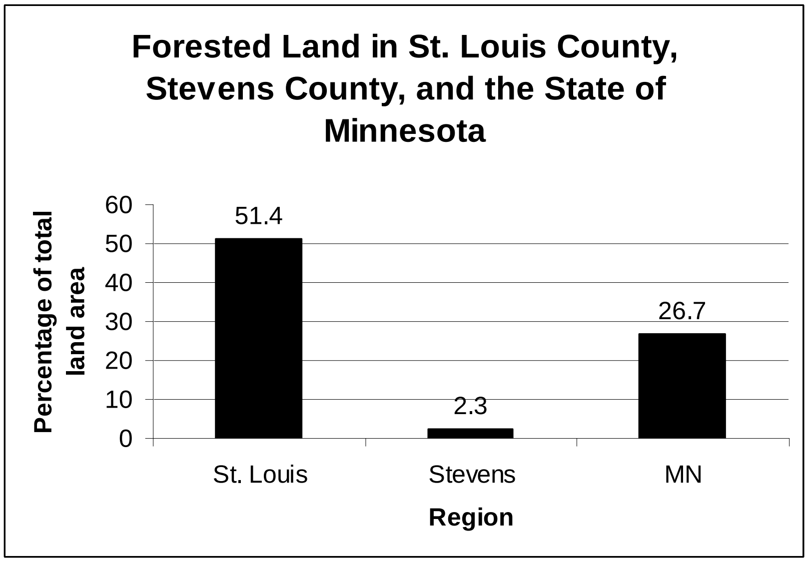
> **Titles:** The title was entered automatically, but it's not a very good title (it was used in the table in order to keep track of the characteristic we are investigating), so we changed it, and labeled the axes properly (see graph following).
>
> **Axes:** There isn't much we can do with this tab, so we left it for later. It's a good idea to let the y-axis display the values, though.
>
> **Gridlines:** Usually, just the automatic setting (major y-axis gridlines showing) is best—for our graph, for example, including the minor y-axis markings is messy and the x-axis gridlines don't tell us anything.

Legend: A legend for our data is redundant because of the title of the graph and the axis labels, but if we had chosen "columns" instead of "rows" in Chart Wizard Step 2 (step 3 for these instructions), we would want to select legend placement (usually "right" is best). Either choice is valid—our example doesn't need a legend, so we chose not to display it.
Data Labels: This is a personal choice. Often, having the values displayed is helpful for clarification if it is hard to read or discern different values from the major y-axis. We'll display values for our example, though it isn't strictly necessary.
Data Table: Generally, don't display this.

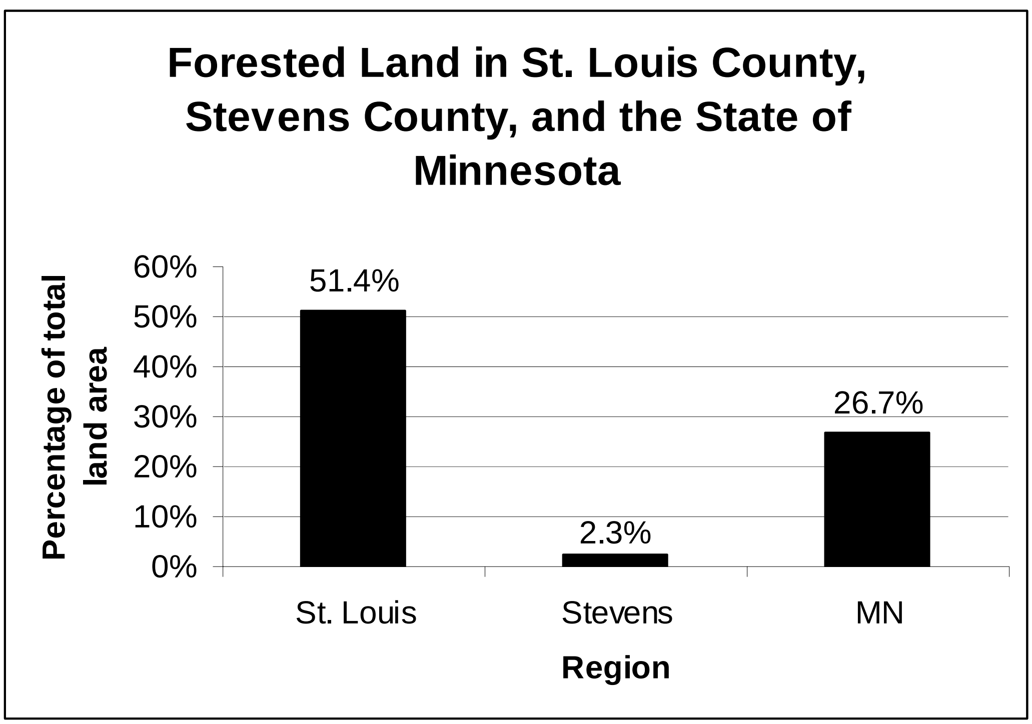
5) Finally, select where you want to place your chart. This is up to you. We put ours as an object in the worksheet because it is smaller and easier to work with. Click "Finish." This is what we got:



6) Now, the final touches. Double-click on the background of the chart (the grey portion) to change this to white. Next, change the color of the bars to black. (Change both border and area.) At this point, you may want to re-size the graph as well, so the title isn't so overpowering. You could call the chart done at this point:

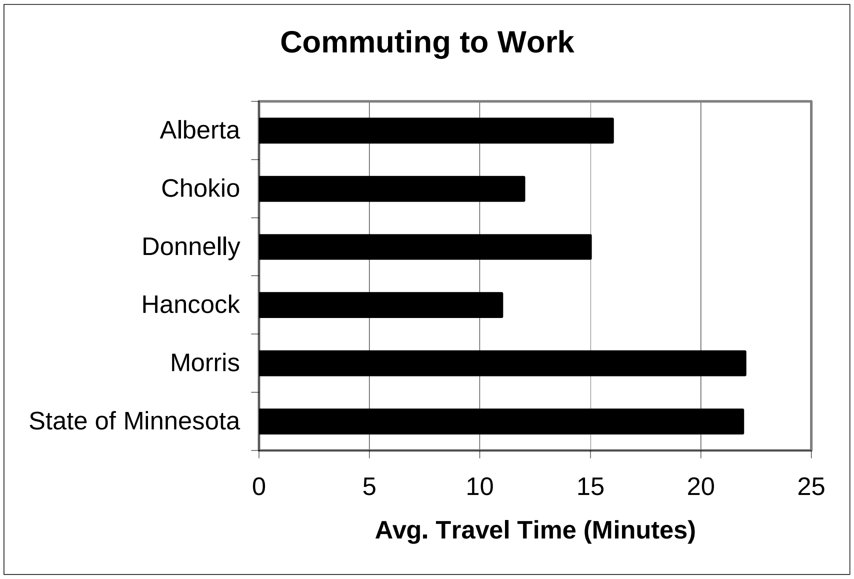


7) Ideally, we could move any data labels that are obstructed by the grid lines of the graph—for example, we could shift the "2.3" above the Stevens County column down slightly by selecting and moving that single data label. If we'd like to display percentages rather than raw numbers, we would have to go back and change our original data from "51.4, 2.3, and 26.7" to "0.514, 0.023, and 0.267" so that Excel reads them as percentages, and then double click on the axis bars to change the numbering type to "percentage" with the desired number of decimal points. You also have to re-format the labels on the bars, then, in the same fashion. Here is our final product:



Pointers for Making the Chart

1. The bar colors should be a **solid color** that will show up well when it is printed in black and white. For two bars, use black and white solid colors. For more than two bars, use solid black and white as well as shading patterns.
2. Remove the gray background color behind the bars. In Excel, double-click the background and in the box that appears, under AREA, select the white color.
3. If there is more than one bar or line, create a legend.



In this example, a line graph was used to compare the county with the state. Using separate colors can be helpful but there are issues when they are printed in black and white newspapers. Use dashes or dots to differentiate the different lines. In Excel, double click each of the lines to change their characteristics. Also, remove the gray background as in the example above.