

A GIS is NOT a map!

One of you made a great observation in their Week 2 Assignment: 'A GIS is not a map, but rather a database that creates a map' (I'm paraphrasing a bit).

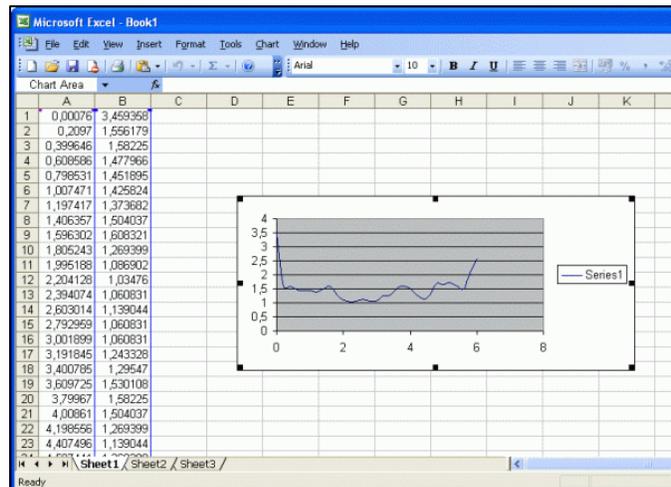
That's a real good point and explains what a GIS is all about.

The MS Excel Analogy

MS Excel is a very useful analogy to a GIS.

In MS Excel your data is stored as a table with columns and rows – essentially a database. You can enter data, look at data, change data, etc. inside the table. You can also perform calculations and analysis, for example the average of a range of cells or more advanced statistical calculations.

But, you can also create graphs that display the data stored in your table. That's often helpful to visualize trends, patterns, or correlations.



In MS Excel, the graph and the underlying table are separate, but linked. Therefore, if you change a cell value in your table, your linked graph changes accordingly. But you can change the way your graph looks (graph type, colors, symbols, labels, etc.) without changing the data in the underlying table.

A GIS is NOT a map!

The same applies to a GIS: A GIS is data stored in a database table and you, as the user, can decide to create a (linked) map from those data.

- You do not have to create a map. You can also create graphs, reports, or choose to analyze your data in table form – whatever makes the most sense in a given situation. This is important: maps are great and very often you will use your GIS to create a map. But, sometimes it is better to show the results of your GIS analysis as a graph.
- You can create whatever map you want and make it look the way you want to...the underlying data remains unchanged.
- But, if you change your underlying data...your map will change accordingly.

There is one big difference between MS Excel and a GIS: you can create a map with a GIS because your data is both spatial and attribute data. MS Excel is only attribute data – MS Excel cannot¹ create maps.

¹ Well...at least not in the way a GIS can. In fact, you can create maps with MS Excel, but that's a topic for another class.

How does a GIS handle its Data?

We will explore how a GIS handles with its data in Week 4. Storing geospatial data (spatial and attribute data) is a bit trickier than storing just attribute data (which is all that MS Excel has to do).

Spatial Data	<i>Where is it?</i>	(= Location, latitude and longitude)
	<i>What is it?</i>	(= Geometry, point, line, or polygon)
	<i>What's next to it?</i>	(= Topology, adjacency, etc.)

Attribute Data *What are its characteristics?*

Basically, you can imagine two different approaches for storing geospatial data.

Plan A: The Kitchen Sink Approach

Here, everything (spatial data, attribute data, pictures, raster data, etc.) is stored in a single, very complicated database table. That sounds appealing, since your GIS is located inside one single file and all you need is the GIS software to read that file.

- In fact, that's where we are headed in the near future. ESRI (the maker of our GIS software) has introduced a new data format called a geodatabase to serve effectively as the kitchen sink. GIS users are gradually changing over to this new data format.
- Geodatabases have some disadvantages: they tend to use up a lot of space on your computer and are so complex that it is almost impossible to figure out what is going on inside the geodatabase.

Plan B: The 'Keep Everything Separate' Approach

Here, everything (spatial data, attribute data, pictures, raster data, etc.) is kept separate and stored as individual files, grouped as families, and linked by so-called index files. This makes some sense, because it neatly separates, for example, the spatial data from the attribute data.

- That's what GIS users are (still) doing right now in so-called shapefiles and we have a special software program called ArcCatalog to help us organize the many individual files.
- Shapefiles have an obvious disadvantage...they are hard to keep organized. On the other hand, each file itself is pretty simple and you can always figure out what is going on.