

# History of GIS

By: Sindy Nicholson (rough draft, photos and more will be added)

It all started back in the caveman days, when the first caveperson drew the outline of their hunting area on the walls of their cavehome, or when the first person used a stick to draw a “map” in the sand to describe how to get to a certain location to someone else. Though very simplistic, these drawings can still be considered a two-dimensional mapping product (that is, using two coordinates to determine one’s location, namely  $X$  and  $Y$ ). Go a step further and you have three-dimensional mapping, which incorporates a third dimension, usually height/elevation ( $Z$ ).

The first use of “GIS” as a scientific method occurred in 1854 by John Snow. Mr. Snow used points on a map of a London residential area during an outbreak of cholera. At this time, it was believed that cholera was transmitted via “bad air” (the “germ theory” was still in its controversial stage at this time and thus had not yet been accepted by the medical community). By using dots to represent cholera cases he was able to show how the cholera outbreak was centred around a contaminated well, even though water tests of the day were inconclusive. He also used statistics to show that when people used water from the known sewage-contaminated parts of the Thames (the river that flows through London), they had higher incidences of cholera than people using water from parts of the Thames without sewage-contamination. It was later found that the contaminated well had been dug less than three feet from an old cesspit (a “well” dug to contain sewage), which had begun to leak into the well causing the 1854 cholera outbreak. Even with all this evidence, Mr. Snow’s theory was rejected by government officials as this oral-fecal transmission method was deemed “too unpleasant” for the public to understand. His work has since been recognized by the medical community and is considered as one of the fathers of epidemiology (study of health and illness of populations, which includes statistics and GIS). But I digress.

Modern GIS (computerized systems) began in the 1960s, however the early 20<sup>th</sup> century was when the development of photolithography (maps separated into layers, something that is integral to computerized mapping systems) began. In 1962, Dr. Roger Tomlinson (working for Canada’s federal Department of Forestry and Rural Development) created and developed the “Canada Geographic Information System” (CGIS) to store, analyze and manipulate data that was collected for the Canada Land Inventory (CLI). CLI was a proposal to determine the land capability of rural Canada. Land capability is determined by mapping information about waterfowl, forestry, wildlife, soils, agriculture and land use (usually at a scale of 1:50,000), with a rating classification factor added to permit analyses of the data. CGIS provided the capacity for overlay, measurement and digitizing (digitizing is a form of scanning, where spatial data from hardcopy maps are digitized/scanned into a usable digital format). CGIS stored the spatial (mapping) and attribute (tabular) information in separate files, which is fundamental to modern GIS systems. CGIS lasted until the 1990s and thus it is the largest digital land

resource database in Canada, and it supports both federal and provincial resource planning and management. Even though CGIS was never available in a commercial format, Dr. Tomlinson is considered to be “the father of GIS.”

Concurrently, by the early 1980s, many vendors - such as: M&S Computing, Environmental Systems Research Institute (ESRI), and Computer Aided Resource Information System (CARIS) - were emerging as commercial versions of GIS software. They all successfully incorporated many of the key aspects of CGIS, and improved upon Dr. Tomlinson’s separation of spatial and attribute data by storing the attribute data in database format. As the 20<sup>th</sup> century came to a close, the growth of various systems were consolidated and standardized to a few platforms and GIS users began to explore the concept of web-based GIS systems. Currently, the most common GIS platform belongs to ESRI, which has anywhere (depending on which source you use) between a 36-80% of the global GIS market. ESRI began in 1969 as a land use consulting firm, and is still privately-held by its’ founders, Jack and Laura Dangermond of Redlands, California.