

Cartography

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Definition: Cartography is the science and art of map making. It encompasses a number of specialized technical topics: the scale of mapping, the method of projection, the symbolization of the data being mapped and many complex issues associated with map design.

The map is the medium by which geographically referenced data can be recorded, presented, and analyzed. It is a functional tool and must be appropriately designed. If the proper colors, patterns, data classes, map scale and projection, symbols, line weights and lettering styles are not employed, the map reader may be easily misled. In practice there are two main types of map: topographic and thematic.

"Topography" refers to the shape of the surface, represented by contours, but topographic maps also show roads and other prominent features. A topographic map is a reference tool, showing the outlines of selected natural and man-made features of the Earth often acts as a frame for other information.

A thematic map is used as a tool to communicate geographical concepts such as the distribution of health facilities, epidemics, infant mortality or contraceptive uptake in an area, etc. There are several types of thematic map design important in communicating population related information. For example, a choropleth map uses reporting zones such as areas or census districts to show data such as the percent of children in poverty, the percent unemployed, or the dependency ratio.

There is a general consensus among cartographers regarding the dangers of the misuse of thematic and particularly choropleth maps. When using choropleth maps the familiar problems of choice of scale and data classes emerge. Moreover, issues relating to how data are represented on the map require consideration of color and shading types. There has been a great deal of literature from statistical graphics and cartography on the use of choropleth maps to display spatial information.¹ To some extent the power of mapping packages today free the user to design a map any way they choose. However, this freedom of choice often results in the construction of very poor and frequently inappropriate maps. The fundamentals of map design, cartographic principles and practice have been laid out by experts in the field of geographic data visualization and cartography (see references below).

References/Sources:

- D.J. Cuff and M.T. Mattson. 1982. *Thematic Maps: Their Design and Production*. Routledge: London, UK.;
- J.S. Keates. 1982. *Understanding Maps*. John Wiley: New York, NK. USA;
- A.H. Robinson, R.D. Sale, J.L. Morrison and P.C. Muehrcke. 1984. *Elements of Cartography* (Fifth Edition). John Wiley: New York, NY, USA;
- B.D. Dent. 1985. *Cartography Thematic Map Design*. Wm.C. Brown Publishers: Dubuque, IA, USA;
- M. Monmonier and G. A. Schnell. 1988. *Map Appreciation*. Prentice Hall: Englewood Cliffs, NJ. USA;
- M. Monmonier. 1991. *How to Lie with Maps*. University of Chicago Press: Chicago, IL, USA.;
- P.C. Muehrcke. 1992. *Map Use: Reading, Analysis and Interpretation* (Third edition) JP Publications: Madison, WI. USA;
- M. Monmonier. 1993. *Mapping it Out: Expository Cartography for the Humanities and Social Sciences*. University of Chicago Press: Chicago, IL, USA.;
- A.M. MacEachren. 1994. *SOME Truth with Maps: A Primer on Symbolization and Design*. Association of American Geographers: Washington DC, USA.

URL:

ColorBrewer is an online tool designed to help people select good color schemes for maps and other graphics
<http://www.colorbrewer.com>

¹ Some of the citation classics are: J.W. Tukey. 1977. *Exploratory Data Analysis*. Addison-Wesley: Reading, MA, USA.; E.R. Tufte. 1983. *The Visual Display of Quantitative Information*. Graphics Press: Cheshire, CT, USA.; E.R. Tufte. 1990. *Envisioning Information*. Graphics Press: Cheshire, CT, USA.; W.S. Cleveland. 1993. *Visualizing Data*. AT&T Laboratories: Murray Hill, NJ, USA.; W.S. Cleveland. 1994. *The Elements of Graphing Data*. AT&T Laboratories: Murray Hill, NJ, USA. Also on a similar theme and deserving of mention, D. Huff. 1954. *How to Lie with Statistics*. Norton Press: New York, NY, USA.. See footnote #2 for specific books in cartography.