

A COMPARISON BETWEEN CONTINUOUS-TONE
AND CLASS-INTERVAL CHOROPLETH MAPS

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ABSTRACT

The question of how many classes to use on a class-interval choropleth map has been studied by cartographers many times. The results of these studies have produced no clear-cut answers except that the number of classes varies for each particular set of data, and for the final use of the map.

In 1973, the idea for production of computer-drawn continuous-tone maps having as many shadings as data values was introduced as an alternative mapping technique. Previous studies comparing the effectiveness of both map types have stated the continuous-tone method as being "at least as effective as the class-interval method."

This thesis offers a different technique to compare the two map types. Test subjects were asked to answer a set of questions in order to evaluate their geographical background/map reading experience. The subjects were then classified as having low, medium, or high "geographic aptitudes." These groups were used throughout the analyses for the basis of aptitude comparisons.

There were six test maps used in this study (three continuous-tone and three class-interval) depicting three pairs of unique spatial distributions. The subjects then answered actual test questions pertaining to the information they saw on the maps. A map was viewed by the subject then turned over, and the test questions were answered for that particular map. This was repeated until all six maps were used.

The goals of this study were to discover, first, if persons with a higher aptitude would score higher on the test than those with a lower aptitude, and second, to see if the continuous-tone method is more effective than the class-interval map for displaying areal data,

Statistical analysis indicated a positive relationship exists between aptitudes and test scores (performance). In addition, statistical analysis suggested that subjects, regardless of aptitude, had equal difficulty with both map types when viewing a more complex spatial distribution.

The second part of this study was designed to find out which of the two map types is the more effective communication device. The continuous-tone maps were found to be superior; however, some design discrepancies may have lent some advantage to the continuous-tone maps.

Another analysis concerned the standard deviations of the responses. In almost every case the standard deviations were lower for the continuous-tone maps suggesting that all subjects were in agreement more often as to what they perceived on the continuous tone maps compared to the class-interval maps.

Other analyses compared point and area type information. Of the five questions asked for each map, three were point questions (relating to a specific point on the map) while the other two were area questions (general overview of the distribution). In most cases the continuous-tone method was a significantly more effective device for answering point type questions, while the class-interval method was significantly more effective when areal type information was desired. The results of this study indicate that both map types have their strengths and weaknesses and possible future research may better delineate these results.