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Eye Movements in Map Comparison - Preliminary Results and Lessons Learned

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Comparing maps of different geographic phenomena, or maps of the same phenomenon at different points in time, is an important task in spatial data analysis and decision-making. The process of map comparison has been studied occasionally by cartographers since the 1970s, but recent improvements in neuropsychological testing equipment and GIS technology had us review this topic in a new light.

In a pilot experiment, we presented pairs of maps to volunteer participants and recorded their eye movements while judging the maps' similarity. We analysed average values of eye movement parameters such as fixation duration and proportions of saccades between the two maps in relation to three factors: the participant's experience in reading maps; the type of map presented; and the actual similarity between the two maps. We found, for example, that different map types engaged viewers in different comparison strategies while we did not find behavioural differences between expert and novice map readers.

We will speculate about implications of experimental cartography for GIS design and report on challenges encountered with this approach.