International Cartographic Association
Association Cartographique Internationale

Common Trends and Pitfalls in Maps Submitted to an Academic Journal

Michael P. Peterson [a,*], Qian Zhang [b]

[a] *University of Nebraska at Omaha, Department of Geography/Geology, Omaha, NE, USA, 1st Author – mpeterson@unomaha.edu,*
[b] *Lanzhou Jiaotong University, Faculty of Geomatics, Lanzhou, China,- ZhangGeo@outlook.com*

* Corresponding author

Keywords: cartographic design, map symbolization, color selection in thematic maps

Abstract:

The *Journal of Geovisualization and Spatial Analysis*, a Springer publication that began in 2017, features articles on a wide variety of topics within the geospatial sciences. Maps are typically a central component of each submission. In the initial review process, maps are examined for meeting minimal cartographic design standards. This paper examines common issues with key map elements including the title, legend, map, north arrow, attribution, and their general placement relative to one another. A primary criterion in this evaluation is whether the map can stand alone while conveying a clear and meaningful message.

It is noted that map titles have largely disappeared from maps in journal submissions. Instead, it is included in the figure caption or omitted entirely. This forces readers to refer to the caption or the text to determine what the map is about. When titles are included on maps, they are typically in very small text at the bottom of the image. A prominently placed title at the top of a map is exceedingly rare in our journal submissions.

While a noticeable title at the top of the map is uncommon, legends are usually prominently displayed, often labeled with the word “Legend.” This raises the question of why other elements, such as the map itself or the north arrow, are not similarly labeled—for example, with “Map” or “North Arrow” in equally large text. The use of the term “Legend” stems from older general reference maps, where it served to help readers interpret the variety of symbols used on these maps. In thematic maps, however, the symbols are typically fewer and more intuitive, such as the outline of a country. Despite this, thematic maps frequently include legends reminiscent of general reference maps, detailing every single point or line on the map, which is often unnecessary.

One common shortcoming in legends is the lack of detailed explanations for the numerical data being represented. Ideally, the legend should provide additional context about how the data was manipulated or standardized before mapping. Instead, legends often feature cryptic variable names, almost always in lowercase, which offer little clarity about the data being displayed.

The color progressions used for symbolizing quantitative data are frequently incorrect. Typically, the selected colors fail to progress evenly from low to high values (Brewer 2016). Additionally, diverging color schemes are often used inappropriately, even when the data do not revolve around a central zero value. These color choices hinder the map’s ability to display recognizable patterns. While visually colorful, such maps fail to effectively convey meaningful information.

North arrows are often disproportionately large and overly prominent. In most cases, their inclusion is unnecessary, as maps are typically oriented by default with north at the top. In addition, with most map projections, the north arrow is not universally true. Furthermore, the data underlying the map is rarely attributed to a specific source. While it can sometimes be found in the accompanying text after some effort, this lack of direct attribution detracts from the map’s credibility.

Lastly, the placement of map elements is often poorly executed, resulting in significant open space within the overall design (Robinson, et al, 1995). Titles, legends, north arrows, and other map elements frequently lack a cohesive organization, diminishing the map’s overall effectiveness as a communication tool. By addressing these common issues, cartographic design in journal submissions can be greatly improved, ensuring maps are not only visually appealing but also effective in conveying meaningful information.

References

Brewer, C. A. (2016). *Designing Better Maps: A Guide for GIS Users (2nd ed.).* Esri Press.

Robinson, A. H., Morrison, J. L., Muehrcke, P. C., Kimerling, A. J., & Guptill, S. C. (1995). *Elements of Cartography (6th ed.).* Wiley.

Abstracts of the International Cartographic Association, 10, 227, 2025
32nd International Cartographic Conference (ICC 2025), 17–22 August 2025, Vancouver, Canada.
https://doi.org/10.5194/ica-abs-10-227-2025