

CARTOGRAPHIC STANDARDS AND PRACTICE IN ACADEMIC JOURNALS

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GIS is being used in more and more fields and by many more practitioners as its cost has decreased and ease of use has increased. The cartographic capabilities of common GIS software have increased at the same time. However, few of these many new users of GIS have training in cartography. They are not geographers but specialists in their own field instead, and they use GIS software as a tool. Their lack of cartographic training is clear in the many maps that appear in publications, presentations, and on the web. It is evidenced by obvious deficiencies in the maps such as misuse (or lack of use) of many techniques and design elements such as projections, generalization, symbolization and color choice, layout and visual hierarchy, and so forth.

While maps that appear in venues such as presentations and on websites typically have little vetting, there is an opportunity to impose some basic map design principles in at least one arena: research papers that appear in peer-reviewed journals. The peer review process can be used to provide feedback not just on the content of the verbiage of the paper but also on the accompanying maps and figures in the paper.

This poster surveys the *Instructions to Authors* in almost 100 journals in Geography and related fields. Over half of the journals have no specific requirements for maps at all. Several journals provide very broad brush instructions, such as “professional quality” or “high cartographic standards”. However, most journals that have any requirements for maps at all are much more narrowly focused. 28 journals have some explicit requirements about scale bars, north arrows, neatlines, gray scales, latitude/longitude ticks, projections, or some combination of these. For instance, eleven journals explicitly require a scale bar. Ten journals require a north arrow (regardless of map scale); one of these has the option of a grid instead.

The only instructions that mention map projections were from two journals of biogeography. Several journals had recommendations for grayscale or halftones.

Some journal have rather odd instructions. Journals published by Bellwether include the advice “On maps, figure-ground relationship can be enhanced by applying a dot screen or stipple to water areas. Use italicized letters for identifying water features.” There were no other specifications for maps, such as a scale bar; why would italic text for water features be so worth mentioning? *Polar Research* asks that labels not be in all capital letters. *Annals AAG* and *Professional Geographer* say that “Appropriate cartographic lettering placement should be observed,” and also that maps should be “tasteful.”

While most journals do not specify any requirements for maps, or have only a few specific guidelines as described above, there are some that take a much more active role. In the *Annual Reviews* series, the graphics guide states that “we have a team of illustration editors who work with your figures to enhance them and ensure they are consistent with house style.” Similarly, *Geography* states that “Most maps and diagrams for inclusion in Geography will have to be redrawn. The GA employs a cartographer to do this so please do not spend lots of time and/or money having them drawn yourself.” Likewise, *International Journal of Health Geographics* states that they “will edit all figures supplied by the author. For this reason it is especially important that authors should supply figures in vector form, to facilitate such editing.” Other journals employ a Cartographic Editor or Cartographic Advisor who work interactively with the author on designing maps to their standards.

The instructions for *Landscape Ecology* were the only ones that provided a reasonably comprehensive set of requirements for maps. The instructions refer to a maximum of four gray shades, a legend, north arrow, scale, latitude/longitude coordinates, a boundary line around the map, and one or two nested inset maps showing the continental and country location of the study area.

With just a few exceptions, the instructions provided to authors of these geography journals is inadequate for having authors produce maps which effectively communicate their research.

Broad generalizations in the instructions (“professional quality”) are no better than such niggling details as using italics for water features or avoiding all capital letters. While a scale bar should certainly be included on almost every map, the requirement that many journals have for north arrows on every map is clearly inappropriate on polar or other small scale maps, on which meridians converge.

The requirement for latitude and longitude is often not helpful. This requirement often leads amateur cartographers to add a graticule to their small scale maps which can often overwhelm the map. The requirement espoused by *Landscape Ecology* for nested inset maps showing the larger context is much more usable for placing a location on the globe for the map reader.

Quite often, maps in journals are unprojected or projected incorrectly. The lack of any mention of projection in all but two journal's instructions is most unfortunate, as the correct use of projections is often poorly understood by GIS users.

Similarly, the almost complete lack of advice about symbolization is also unfortunate. GIS users untrained in cartography often choose symbolization inappropriate for their data, such as a multi-hued color scheme for quantitative data (rather than a scheme which varies by color value).

The poster concludes with recommendations of cartographic practices that publishers require of authors. The recommended practices cover generalization, map projection, visual hierarchy, map layout, data classification and symbolization, and map elements.