

EGU2020-321

<https://doi.org/10.5194/egusphere-egu2020-321>

EGU General Assembly 2020

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How Earth Scientists Communicate With Maps?

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To communicate the results of a research or scientific facts and theories concerning spatial characteristics, every fields of geoscience use thematic cartography to represent spatial information. Because of this, journals, books and other publications about earth sciences has always needed accurate, reliable and clear methods of map visualization. A map should thematically fit in the body of the publication and should enrich the content. It is an extra task for scientist to take basic cartographic and visual rules into consideration, but with correct methods their publications can earn multiple benefits, such as increased readership and wider dissemination.

When using cartographic methods, we need to find the balance between the triad of i) precision, ii) quality of visual representation and iii) quantity of thematic data. The primary aim is to give an overall 'image' of the concerning spatial phenomena that effectively complements the written text of an article. However, these representations sometimes lack some important marks that help the reader to understand the information. Our study focuses on the quality of cartographic visualization in geosciences measuring these marks with the help of an objective system of criteria. These included image quality, cartographic elements that help to locate the studied area (e.g. coordinates), topographic content and copyright rules. By the use of this system we could give grades for each map for each criterion. We have assessed more than 300 maps per field of geoscience (geology, geography, geophysics, meteorology, cartography) in international and Hungarian journals and conference posters.

By summarizing the grades, multiple conclusions can be drawn. We can analyse the map usage habits of each science field: what type of map do they usually use (e.g. thematic or topographic), do they use maps to present results or just give an overview about a studied area and what are the common mistakes that may confuse the reader when interpreting a map. These statistics also hold the opportunity to give advices for each branch to develop their map communication skills. It was also possible to inspect the cartographic practices of each countries. We have found that there is a large spatial variability in the map use habits of different cultures. This can either mean specific but correct ways of visualization or solutions that make the map hard to understand and should not be followed. By examining this spatial factor, proposals concerning objective map element usage can be given to countries or even to whole regions to improve their cartographic communication skills.

