

Communicating Uncertainty in Journalistic Maps: Perspectives from a Data Journalism Research Project

Christoph Kinkeldey

Hamburg University of Applied Sciences (HAW Hamburg), christoph.kinkeldey@haw-hamburg.de

Keywords: Journalistic maps, Uncertainty communication, Data journalism, Map design

Abstract:

Maps are a central medium in data journalism, providing spatial context for places and geographically distributed phenomena such as politics, economics, climate, and conflict, while also helping outlets inform and engage audiences (Gomes et al., 2026). At the same time, the communication of uncertainty has become an increasingly important concern in data journalism. In maps, uncertainty may arise from incomplete or inconsistent geographic information, positional imprecision, or model-based estimates (MacEachren et al., 2005). Recent empirical work further suggests that visualizing spatial uncertainty in maps can support interpretation, for example through variations in symbol size, transparency, or uncertainty areas, although the effectiveness of these encodings depends on context and map design (Keil et al., 2024). In journalistic practice, however, such uncertainty is rarely systematically represented in the map itself and may instead remain implicit or be addressed only in annotations or surrounding text.

This contribution presents perspectives from a research project on uncertainty communication in data journalism. Focusing specifically on cartographic representations, we investigate how different forms of uncertainty manifest in journalistic maps and how they are currently communicated. Our analysis is informed by a structured collection of real-world examples (Figure 1) and a scenario-based framework (UUS) of recurring uncertainty scenarios, including spatial uncertainty, forecasts, and missing data (Possin & Kinkeldey, 2025).

We provide an overview of common ways uncertainty is addressed in journalistic maps and highlight recurring limitations in current practice. We further show how the UUS framework can support the classification of uncertainty scenarios in journalistic mapping, and derive initial recommendations for more transparent and effective cartographic communication. In general, we argue that uncertainty should be treated as a practical design concern in journalistic mapping and discuss how this perspective can support more responsible and trustworthy data journalism.

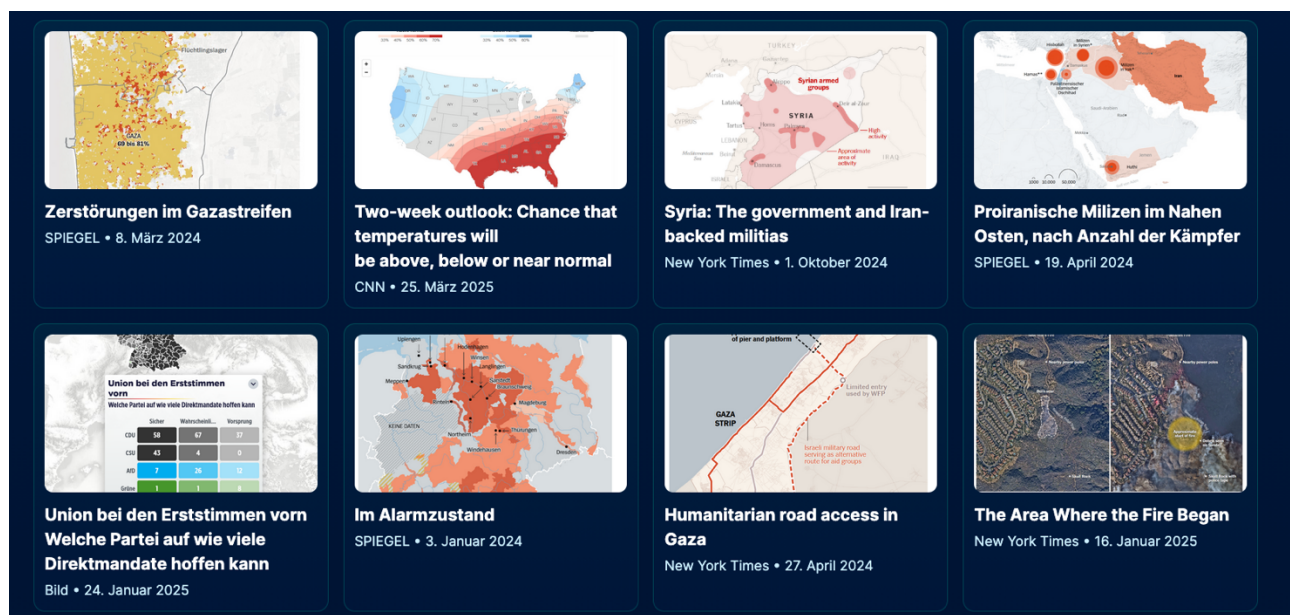


Figure 1. Examples of journalistic maps from our collection, illustrating different ways spatial uncertainty appears in news media.

Acknowledgements

This work was partly funded by the German Federal Ministry of Research, Technology and Space (BMFTR) as part of project *uncertainty4ddj*, grant number 03DPS1120.

References

- Gomes, A., Brito, E., Morais, L. A., & Ferreira, N. (2026). How do Data Journalists Design Maps to Tell Stories? *IEEE Transactions on Visualization and Computer Graphics*, 32(1), 167–177. <https://doi.org/10.1109/TVCG.2025.3633911>
- Keil, J., O'Meara, D., Korte, A., Edler, D., Dickmann, F., & Kuchinke, L. (2024). How to visualize the spatial uncertainty of landmark representations in maps? *Journal of Environmental Psychology*, 99, 102441. <https://doi.org/10.1016/j.jenvp.2024.102441>
- MacEachren, A. M., Robinson, A., Hopper, S., Gardner, S., Murray, R., Gahegan, M., & Hetzler, E. (2005). Visualizing Geospatial Information Uncertainty: What We Know and What We Need to Know. *Cartography and Geographic Information Science*, 32(3), 139–160. <https://doi.org/10.1559/1523040054738936>
- Possin, B., & Kinkeldey, C. (2025). *Charting Scenarios: A Framework for Uncertainty Visualization in Data Journalism Practice*. Poster abstract presented at IEEE VIS 2025. https://doi.org/10.31219/osf.io/n3bk4_v1