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## When color theory meets seismology: Principled visualization design for seismic hazard maps

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Probabilistic seismic hazard estimates are a key ingredient of earthquake risk mitigation strategies and are usually communicated through seismic hazard maps. Though evidence exists that visual design properties are key for effective communication using such maps, few authors describe their approach in visualizing seismic hazard. Current maps use colors, legends and data classification schemes which are suboptimal, from the visualization perspective. As such, they have the danger of miscommunicating seismic hazard. We present a set of principles regarding color choice, legend design, and classification of the continuous hazard estimate for categorical mapping. These principles are based on (1) communication goals for the seismic hazard phenomenon, (2) empirically-validated recommendations from the visualization literature and (3) other best practices in map design. We discuss the process of redesigning the German seismic hazard map using these principles. A set of prototype maps adhering to these principles are presented. We also describe ongoing efforts to test the redesigned maps, as well as how to use them to further communicate the uncertainty around probabilistic hazard estimates.