The cartographer’s dilemma

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Abstract: Cartographers over the centuries have devised many interesting ways of mapping the Earth on a piece of paper. Mathematically, each such map can be identified with a function from a sphere onto a subset of the Euclidean plane. But no paper map of a sphere is perfect; they all distort the distances between some points.

This leads to an interesting question: Is there a best possible map? That is, is there a map that distorts distances as little as possible? And what is the minimum possible distortion? This talk will give the answer to those questions for maps of two-dimensional spheres and a partial answer in all dimensions. Which begs the question: What exactly is a higher-dimensional sphere, anyway?