

Title: Snyder's GS50 Projection for the Mapping of all 50 United States

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Abstract:

John Snyder is known within cartography primarily as the author of “Flattening the Earth” and as the inventor of the Space Oblique Mercator map projection. However, one of his principal contributions has gone largely unnoticed, the GS50 projection. GS50 is a conformal projection, custom-designed to contain less than 2% scale variation across all 50 United States, and optimized to minimize the sum of geometric distortions. It does so by using an oblique stereographic projection as the base, then empirically minimizing the overall distortion using 10th order complex polynomials, rather than simple geometric forward and inverse transformations. Unfortunately, the complexity of the projection transformation has meant that few map projection software tools, other than the GRASS GIS, have included it among those supported. Nevertheless, its simplicity and inclusiveness—showing all 50 states accurately, and not just the lower 48—dictate that its use is to be encouraged, for example in new media, and the World Wide Web, and in education. In this paper, I review Snyder's GS50 projection and its advantages, describe how to create the projection within software, and present into the public domain shape and svg files that allow the projection's use in everyday mapping. My goal is to encourage the use of this highly creative and beneficial projection within and beyond the field of cartography.