Spatial Data Uncertainty for the Masses

A Geography Colloquium Presentation

by

Dr. Ashton Shortridge

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Abstract:
With the explosion in online, contributed geographic data presents significant challenges. A critical one is spatial uncertainty. Despite decades of research, effective tools for modeling and propagating spatial data uncertainty are still not in widespread use by traditional geographic data producers. This deficit is magnified for the citizen-producer and user of 2010. Data production standards are not enforceable for someone entering markers locating their favorite rock climbing spots, or for someone reporting the most recent spread of a wildfire via a smartphone app to a volunteer website. Nor is the uncertainty in location quantified when someone enters a request to generate a route between vague spatial locations like "UCSB campus" and "State Street."

To address this gap in the representation of volunteered geographic information, I report on the design and implementation of a prototype, client-side, Javascript library, called OpenError, to enable web mapping application developers to incorporate uncertainty into their products. This presentation has three objectives: First, it provides theoretical background on spatial data error modeling and propagation that forms the basis for OpenError. Second, it discusses some important design considerations to enable the models to be calculated efficiently and to be readily implemented by developers into a range of web mapping platforms, including OpenLayers and Google Maps. Third, it demonstrates the functionality of some sample OpenError applications to communicate data uncertainty and its implications for users in valuable and engaging ways.

Bio:
Ashton Shortridge is an Associate Professor in the Department of Geography at Michigan State University. His MA (1997) and PhD (2000) are from UCSB Geography, so this is a homecoming—his last presentation in Santa Barbara was his dissertation defense! Dr. Shortridge's core research interests are threefold: spatial information uncertainty, terrain analysis, and health geography, especially involving questions of health care access. He teaches GIS, spatial analysis and statistics. His wife and three daughters (one born in Storke Family Housing, another in a now-vanished hospital near the Mission) wish they could visit Santa Barbara this time, too!