The Ohio State University
Department of Geography
COLLOQUIUM SERIES 2012-2013

From Computational Geography to CyberGIS: The Geospatial Dimensions of Extreme Digital Transformation

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As a spatial data deluge permeates broad scientific and societal realms, many fields both fuel and depend on the research and development of cyberGIS based on multi-scale synthesis of computational and spatial thinking enabled by cyberinfrastructure – an evolving infrastructure of communication, computing, and information technologies. CyberGIS – defined as cyberinfrastructure-based geographic information systems – has emerged as a new generation of GIS representing an important research direction in cyberinfrastructure and geographic information science. This presentation describes a five-year multi-institution effort funded by the National Science Foundation to advance the science and technology of cyberGIS, particularly for enabling scalable analysis of big spatial data, computationally intensive spatial analysis and modeling, and collaborative geospatial problem solving and decision making. Several fundamental research problems are addressed while a set of challenges and opportunities are identified for advancing computational geography and cyberGIS. The presentation underpins the major elements of the emerging field of cyberGIS and discusses how these elements help chart the extreme digital transformation of geospatial research and education.

February 1, 2013
Derby Hall Room 1080
3:30 pm

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