Future Directions of Map Analysis and GIS Modeling

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Most of GIS's recent growth has been in its capabilities as a *"technical tool"* for corralling vast amounts of spatial data and providing near instantaneous access to remote sensing images, GPS navigation, interactive maps, asset management records, geo-queries and awesome displays. However, GIS as an *"analytical tool"* hasn't experienced the same meteoric rise— in fact it might be argued that the analytic side of GIS has somewhat stalled over the last decade. But the future of GIS is moving from a "down the hall and to the right" specialist's role providing mapped data, to a broader and more active role providing spatial information through map analysis and modeling that directly interacts with research, policy formation, planning and management decisions. The shifting emphasis from data–centric tools for mensuration (*Where* is *What*) to application-specific constructs of prescriptive mapping (*Why*, *So What* and *What If*) infuses consideration of geographic patterns and relationships within problem-solving contexts. To be effective, this analytical paradigm shift requires a comprehensive framework for map analysis concepts and procedures as direct spatial extensions of traditional mathematics and statistics thereby enabling individuals with minimal or no GIS background to develop spatial reasoning skills—thinking with maps. *This presentation assesses the circumstances, driving forces, potential and future directions of map analysis and modeling.*

References: *(PowerPoint slide set and supporting materials for this presentation is posted at www.innovativegis.com/basis/present/Manitoba_Sep2014/)*

- **Beyond Mapping Compilation Series** — *a compilation of nearly three hundred "Beyond Mapping" columns appearing in GeoWorld 1989 to 2013 organized into four online/hardcopy books.*
  http://www.innovativegis.com/basis/MapAnalysis/ChronList/ChronologicalListing.htm
- **A Brief History and Probable Future of Geotechnology** — *white paper on the evolution and future directions of GIS technology.*
  http://www.innovativegis.com/basis/Papers/Other/Geotechnology/Geotechnology_history_future.htm
- **Simultaneously Trivializing and Complicating GIS** — *white paper describing a mathematical structure for Spatial Analysis/ Statistics.*
  http://www.innovativegis.com/basis/Papers/Other/SpatialSTEM/TrivializingComplicating_GIS.pdf
- **SpatialSTEM: a mathematical/statistical framework for understanding and communicating grid-based map analysis**, *paper presented at ASPRS 2013 Annual Conference, Baltimore, Maryland, March 28, 2013.*
  http://www.innovativegis.com/basis/Papers/Other/ASPRS13_sSTEM/
- **A Math/Stat Framework for Grid-based Map Analysis and Modeling** — *Topic 9, Book IV in the Beyond Mapping Compilation Series online book in the four-part compilation series of the Beyond Mapping columns published in GeoWorld since 1989.*
  http://www.innovativegis.com/basis/BeyondMappingSeries/BeyondMapping_IV/Topic9/BM_IV_T9.htm
- **GIS Evolution and Future Trends** — *Topic 10, Book IV in the Beyond Mapping Compilation Series online book in the four-part compilation series of the Beyond Mapping columns published in GeoWorld since 1989.*
  http://www.innovativegis.com/basis/BeyondMappingSeries/BeyondMapping_IV/Topic10/BM_IV_T10.htm

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