Some Thoughts on the Future of GIScience

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- geospatial technology
- mainstreaming of spatial thinking
- example: spatial econometrics

Geospatial Technology

- ubiquitous GIS
- new computing paradigms
- geoinformatics

Spatial Thinking

- disappearance of disciplinary bounds
- mainstream sciences adopt spatial perspective
- daily practice adopts spatial perspective

- drives demand for theory
- how to deal with massive geospatial (space and space-time) information: methodological and computational needs
- education and training
- new modes: collaboratories, cyberinfrastructure

Spatial Econometrics

- from the fringe to the mainstream
- spatial aspects in applied work
- who are the drivers
- challenges: theory, methods, computation

Ten Things

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I have three offices and the keys to prove it.

Charge by MFG

- To give a perspective on “the ten most significant discoveries in GIScience”.
- My quick reply was that I wasn’t sure there were any discoveries…

GIScience

- We do basic research, but much of what we do can be viewed as “translational” science
- In medicine the term is “from the bench to the bedside” or “from mouse to man”
- Ours might be “from map to machine”
  - Overlay (light tables)

I'll Use Two Categories

- Perhaps the single biggest thing that we have discovered is "GIScience" itself… but that's kind of nebulous, so I'll turn to abstract categories to make things concrete

1. Abstraction/Theory

Abstraction/Theory

- **Transformational "view"**
  - (Waldo Tobler, map "algebra")
- **Topological concepts**
  - (initially enabled topological data model, error checking, but then Max et al. relations)
- **Hierarchical data structures**
  - (interleaved binary addresses!)
- **Ontologies**

Operations

- **Geocoding**
  - (from text to coordinates: basis for mashups and Web 2.17, aside from affine, the most common transform?)
- **Overlay and other map layer manipulations**
  - (band sweep, etc., but basic ops have not evolved)
- **Local Spatial Analysis / Statistics**

If you're counting, I only fired nine bullets

- NCGIA supported work in 1990s that, with hindsight, was related to cyberinfrastructure (NSF term, not mine) and e-science (CSDM, etc.)
- Despite subsequent good work at UCSB and elsewhere, need stronger engagement with distributed collaboration, simulation and data intensive computing

The End