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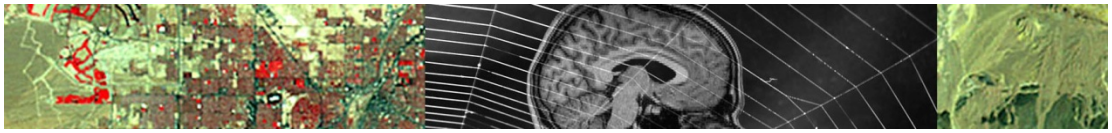

Spatial Concepts Curriculum for GIS and Design: Introduction

Michael F. Goodchild
University of California
Santa Barbara

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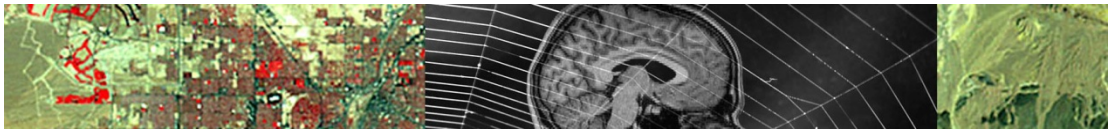
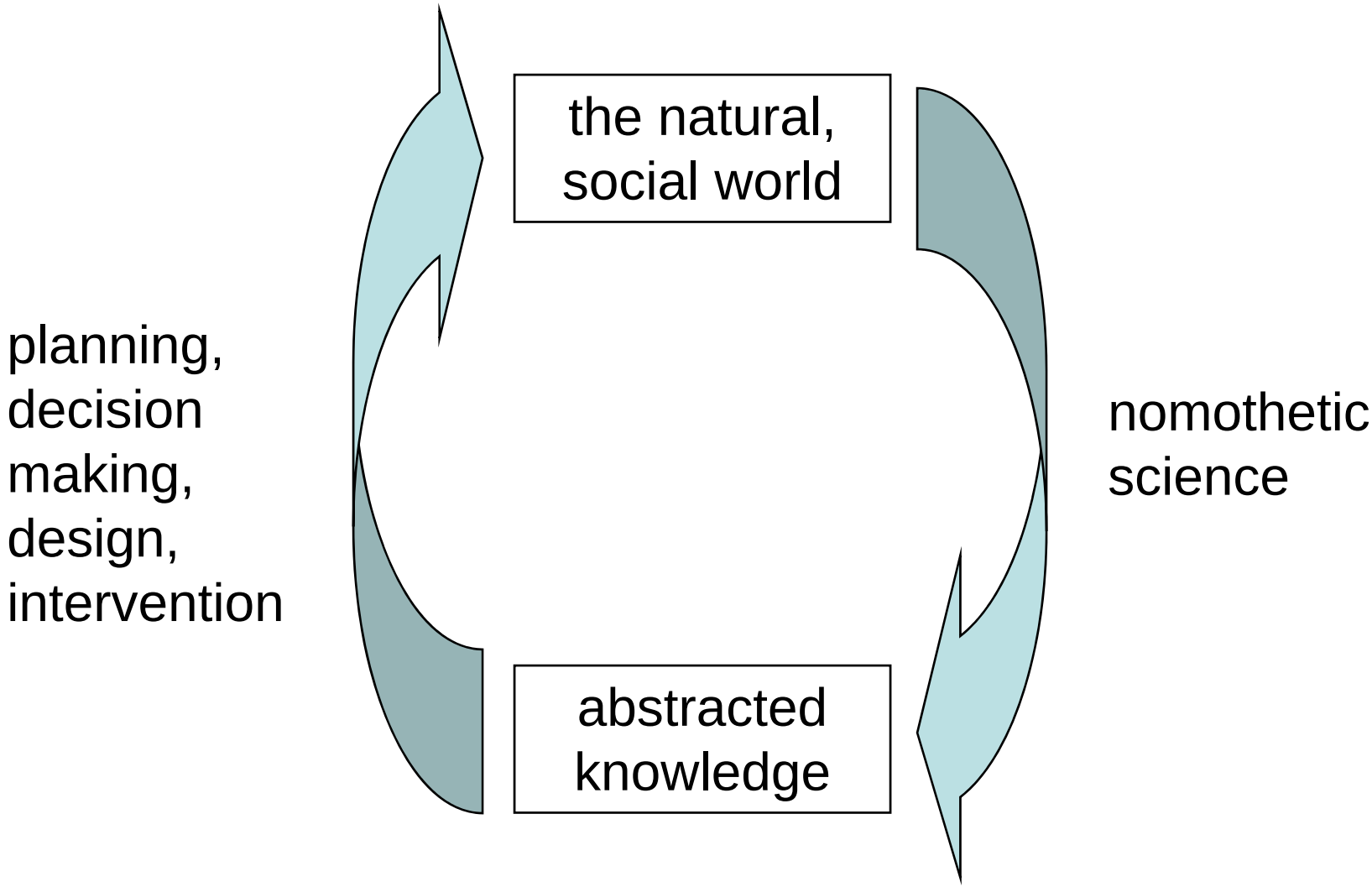


A broader effort

- Spatial thinking
  - "a cognitive skill that can be used in everyday life, the workplace, and science to structure problems, find answers, and express solutions using the properties of space. It can be learned and taught formally to students using appropriately designed tools, technologies, and curricula." *Learning to Think Spatially,* National Research Council, 2006.
- GIS is becoming easier to use
  - but thinking critically about it is as important as ever
- In a world of Google Earth
  - what does *everyone* need to know?

Multiple Intelligences

- Howard Gardner
  - Harvard
  - **“Spatial intelligence** involves the potential to recognize and use the patterns of wide space and more confined areas.”
  - one of seven types of intelligence


the natural, social world
abstracted knowledge
planning, decision making, design, intervention
nomothetic science

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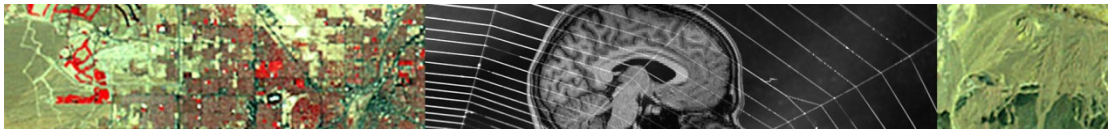

What do philosophers of science say?

- For example, Laudan:
  - science is a process of problem-solving
  - it is irrelevant whether the problem is one of detached study, or engaged action
  - the normal apparatus of science applies in both cases
    - rigorous definitions
    - shared terminology
    - replicable results
    - generalizable conclusions
  - L. Laudan, *Beyond Positivism and Relativism* (Westview Press, 1996)

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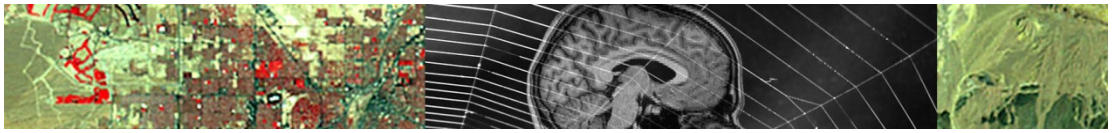
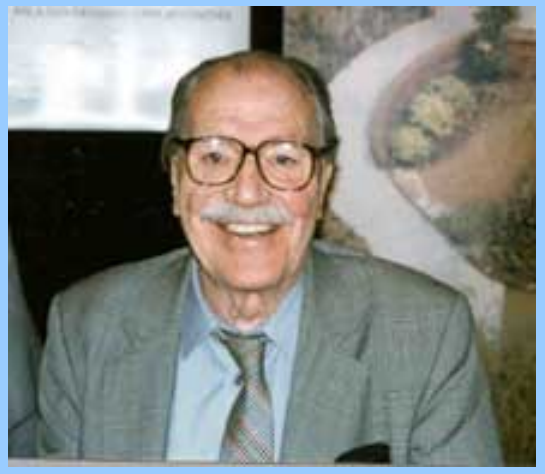


A model for landscape architecture

- Ian McHarg's school at the University of Pennsylvania



Ian McHarg
1920-2001

Meteorology

Geology

Hydrology

Plant ecology

Animal ecology

Limnology

Computation

Remote sensing

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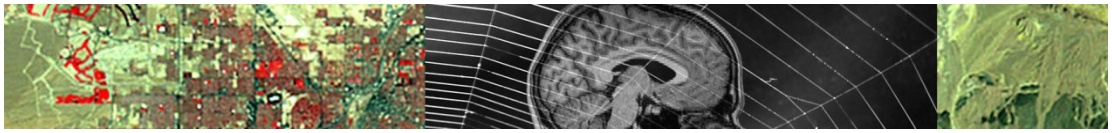

45 years later

- Has a science of intervention evolved?
- Is intervention more scientific?
- Has the role of technology advanced?
  - what are its components?
- How should we update the McHarg model?

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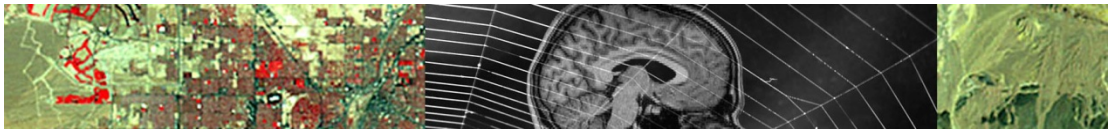

The McHarg team of 2009

- Information scientists (GIScientists)
  - information integration
  - information management
  - semantic interoperability
  - visualization of scenarios
  - spatial decision support systems
  - public-participation GIS

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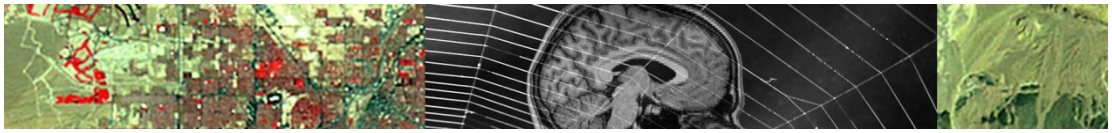

Central Questions

- To what extent are the fundamental spatial concepts that lie behind GIS relevant in design?
- To what extent can the fundamental spatial concepts of design be addressed with GIS?
- Is it possible to devise a curriculum designed to develop spatial thinking in both GIS and design?

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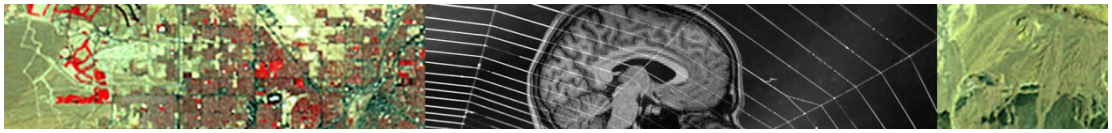

Specialist meeting

- Upham Hotel, Santa Barbara, December 15-16
- http://ncgia.ucsb.edu/projects/scdg/
- 40 participants
  - geographers, GIScientists, planners, landscape architects

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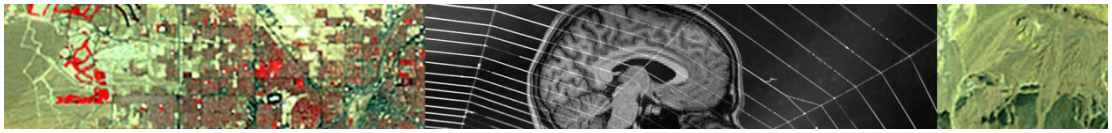

The panel

- 12-minute presentations on the meeting's theme, discussion, and conclusions:
  - Helen Couclelis, UCSB
  - Dan Sui, TAMU
  - Diana Sinton, University of Redlands
- 6-minute presentation on teachspatial.org
  - Karl Grossner, UCSB
- <6-minute commentaries:
  - Karen Kemp, independent Hawaiian scholar
  - Stéphane Roche, Laval
  - Jeff Howarth, Middlebury
  - Bob McMaster, Minnesota
  - Sara Fabrikant, Zürich