Technology as a Defining Discourse

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So long as we do not, through thinking, experience what is, we can never belong to what will be.

The flight into tradition, out of a combination of humility and presumption, can bring about nothing in itself other than self deception and blindness in relation to the historical moment.

Source: M. Heidegger, *The Question Concerning Technology and Other Essays*, translation by W. Lovitt (New York, Harper Torchbooks, 1977), “The Turning,” p. 49; “The Age of the World Picture,” p. 136.

Trends We Should Care About

- The world is becoming much more complex and information dense – meaning ICT becomes more critical
- Information structures are growing at every systems level – e.g., the “cognitive city” is a complex of smart materials, smart buildings, smart infrastructure, smart integrated infrastructures – all linked to human systems
- Information technologies are changing what it means to be “human” along many dimensions
- Professionals and firms are being charged by society with responsibility not just for their actions, but for their technology systems (cf: Monsanto and genetically modified organisms); the ethics that apply at systems scale have not been developed
- Highly likely that technological evolution will become discontinuous in terms of cultural ability to adapt (especially with NBIC convergence (nanotech, biotech, ICT, and cogsci))

Trends We Should Care About: 2

- Much of this rapid technological evolution is captured in the concept of "NBIC convergence" – the convergence of the four foundational technological systems of nanotechnology, biotechnology, information and communications technology, and cognitive science.
  - Nanotech: we're already working in this domain. Any political or regulatory backlash would cause major disruption
  - Biotech: integration of wetware, hardware and software continues at all scales (e.g., chip level; brain level; prosthetics; genetic computers, etc)
  - ICT: self-explanatory, but the potential issues are explosive (e.g., digital divide as brain hardwiring)
  - Cognitive science: electronics and communication systems major components of "extended mind" cognitive structures: we begin with prosthetics and end up with major industrial and infrastructure systems direct-wired to brain

Nanotech: Levels of Consideration

- Basic toxicology of nanoparticles: we know what needs to be done and how to do it.
- Environmental applications: the possibilities of low waste manufacturing and new remediation/waste control technologies are apparent.
- Environmental and social implications of nanotechnology: generally clueless.

Lessons from GMOs

- Basic industrial research was competent, and all relevant regulatory requirements were met both in the US and EU
- Some concern that questions about the systemic implications of GMOs had not been adequately addressed
- Main attack is ideological: GMOs are “playing God;” effective fear politics picked up this theme (“frankenfoods”); enhanced by mad cow experience and concern over industrial power, and industry failure to respond sensitively to customer concerns
- Adoption of GMO technology by China and India trump EU effort to halt it – future of GMOs, and NBIC, won’t be determined by US or EU, but by China, India, Brazil. Technology is international competition at this point; national policies are important but not determinitive

Greater Phoenix 2100

Visualization tools

- Regional e-Atlas
- SIM Phoenix
- Decision Theater
- Urban-SAT(s)

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Altogether UrbanSim requires about 60 tables

- These tables include:
  - Database Tables about Development Types
  - Database Tables about Employment
  - Estimation Data Writer Tables
  - Database Tables about Events
  - Database Tables about Geographies
  - Database Tables about Grid Cells
  - Database Tables about Households
  - Database Tables about Indicators
  - Model Configuration Tables
  - Database Tables about Transportation Analysis Zones

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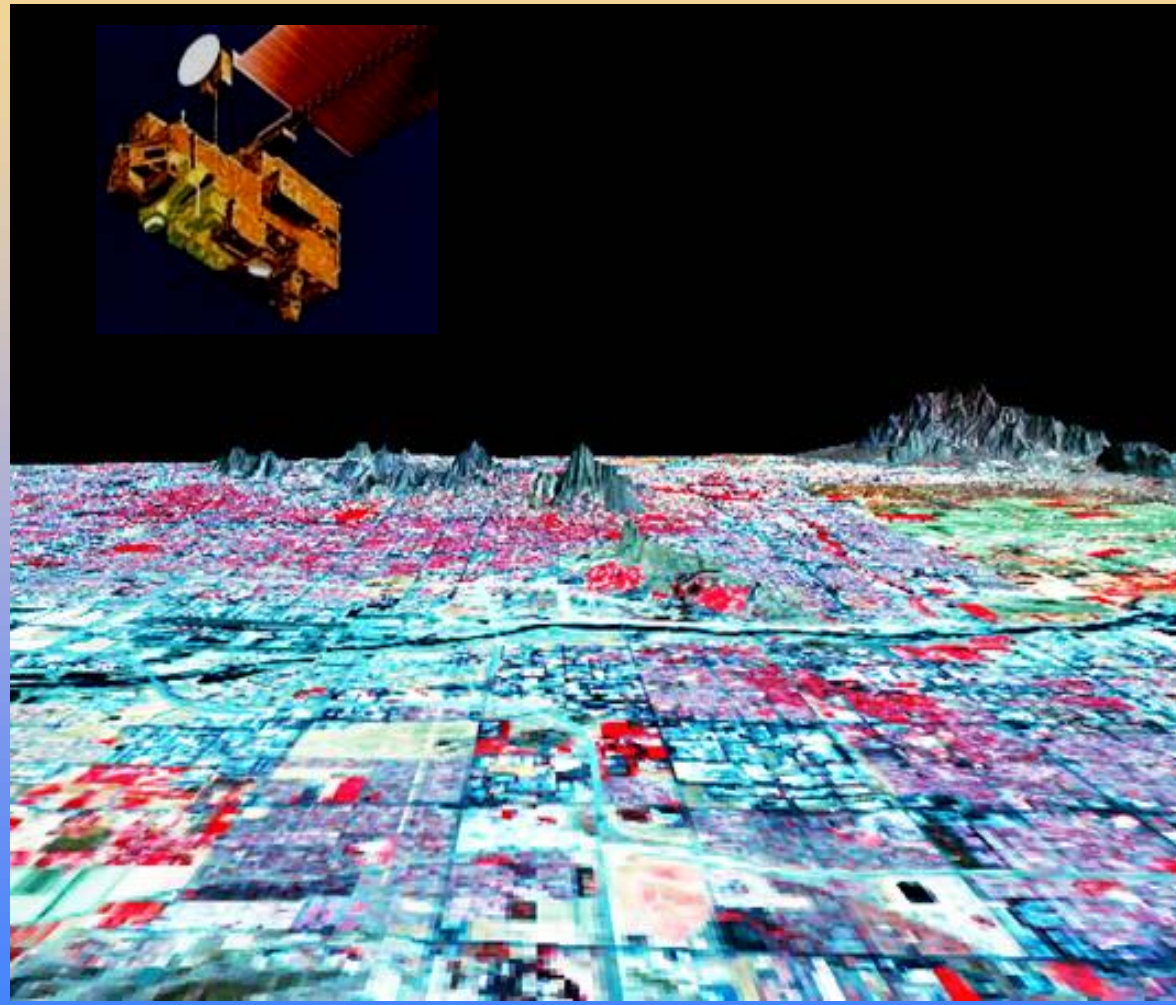
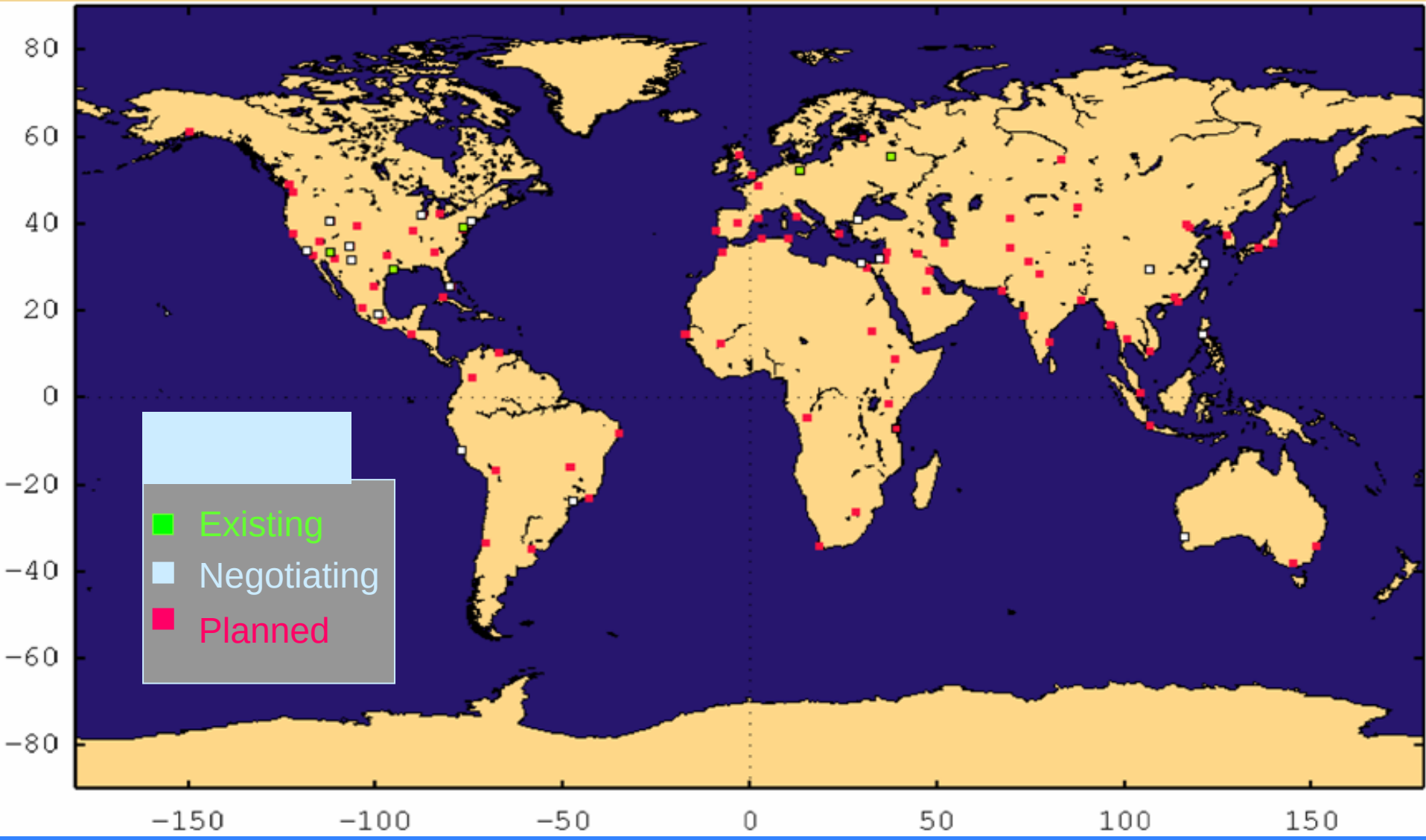


100 Cities Project:

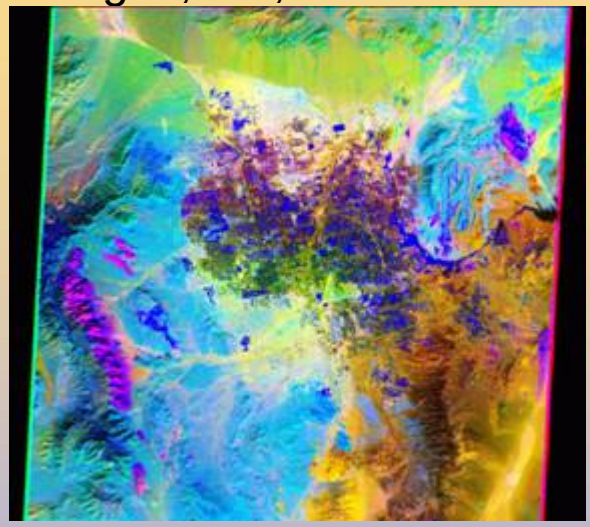
Standardized, repeated urban remote sensing



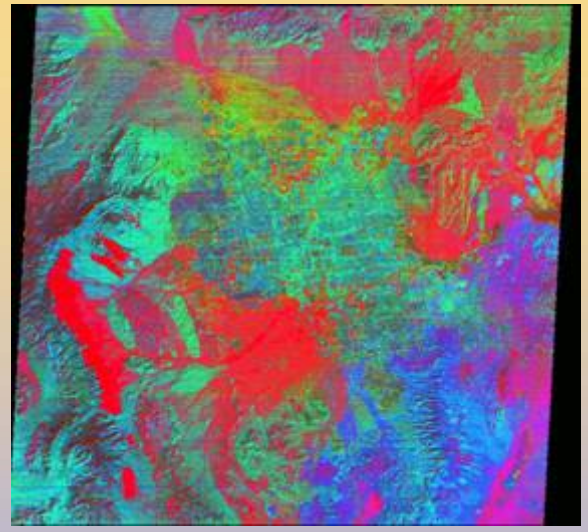
Different sensors = different information

Las Vegas, NV, 17-Oct-2000

Visible to near-infrared
15 m/pixel



Shortwave infrared
30 m/pixel



Thermal infrared bands
90 m/pixel

Major land cover classes

- Vegetation health
- Soil properties
- Soil contamination

Urban surface materials

- Rooftop materials
- Energy use
- Fugitive dust production
- Metal contamination
- Ecological communities

Surface energy balances

- Regional climate models
- Anthropogenic heat sources
- Heat island development