The Importance of Spatial Literacy

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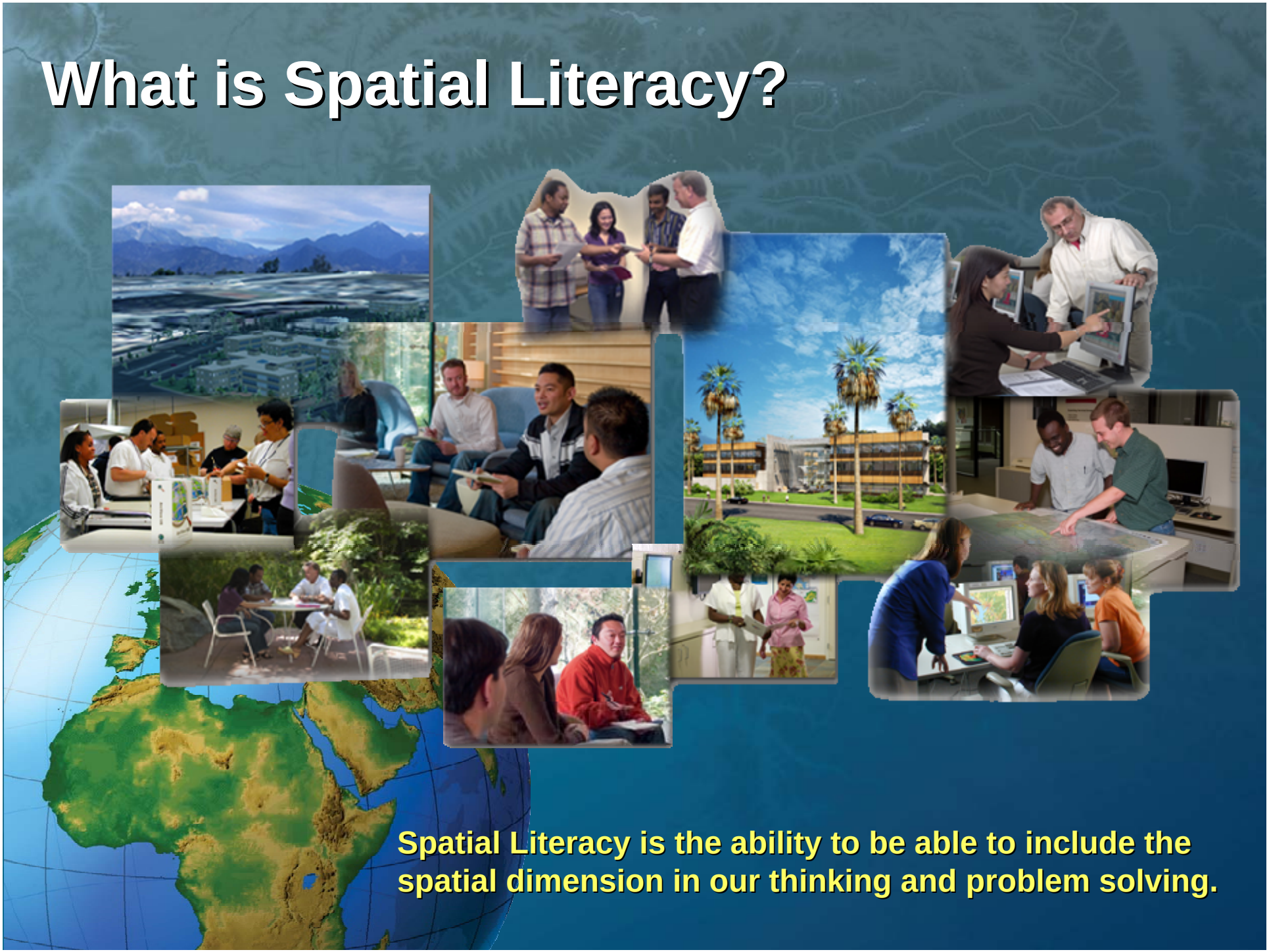
What is Spatial Literacy?

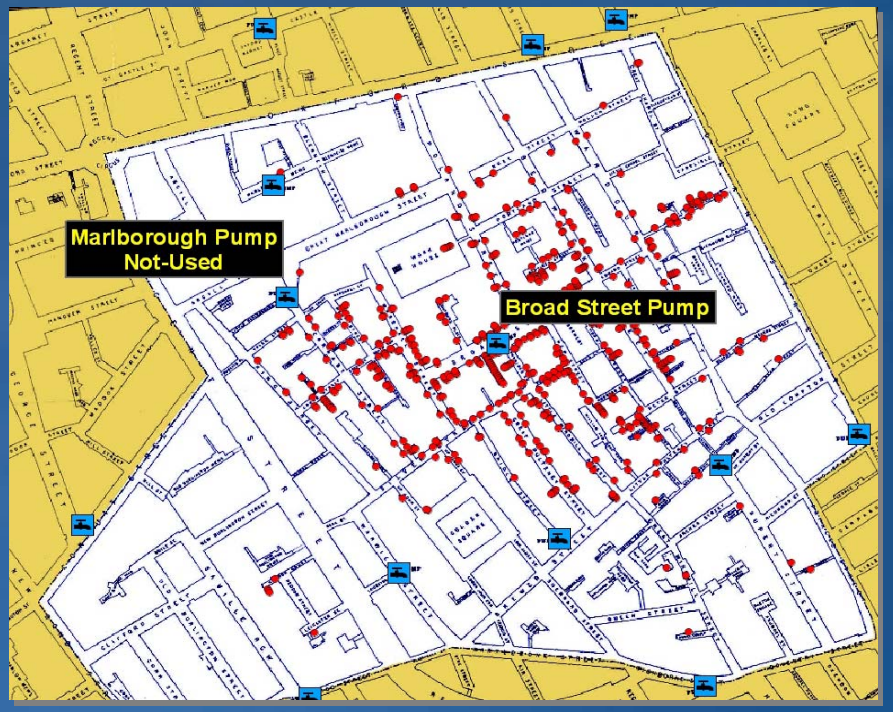


Spatial Literacy is the ability to be able to include the spatial dimension in our thinking and problem solving.

Why is Spatial Literacy Important?

Almost all of the world's problems exist in these dimensions:

- **Time**
- **Space**
- **Matter**



What is a spatial thinker

- ***Enjoys*** **spatial thinking**
- ***Practices*** **informed spatial thinking**
- ***Thinks*** **of the world in all its dimensions**
- ***Solves*** **problems within their spatial context**

Learning Geography

How do we learn geography as a child?

1. Place

2. Navigation

3. Patterns

The geographic approach

ACQUIRE geographic resources

EXPLORE geographic data

ANALYZE geographic information

VISUALIZE geographic results

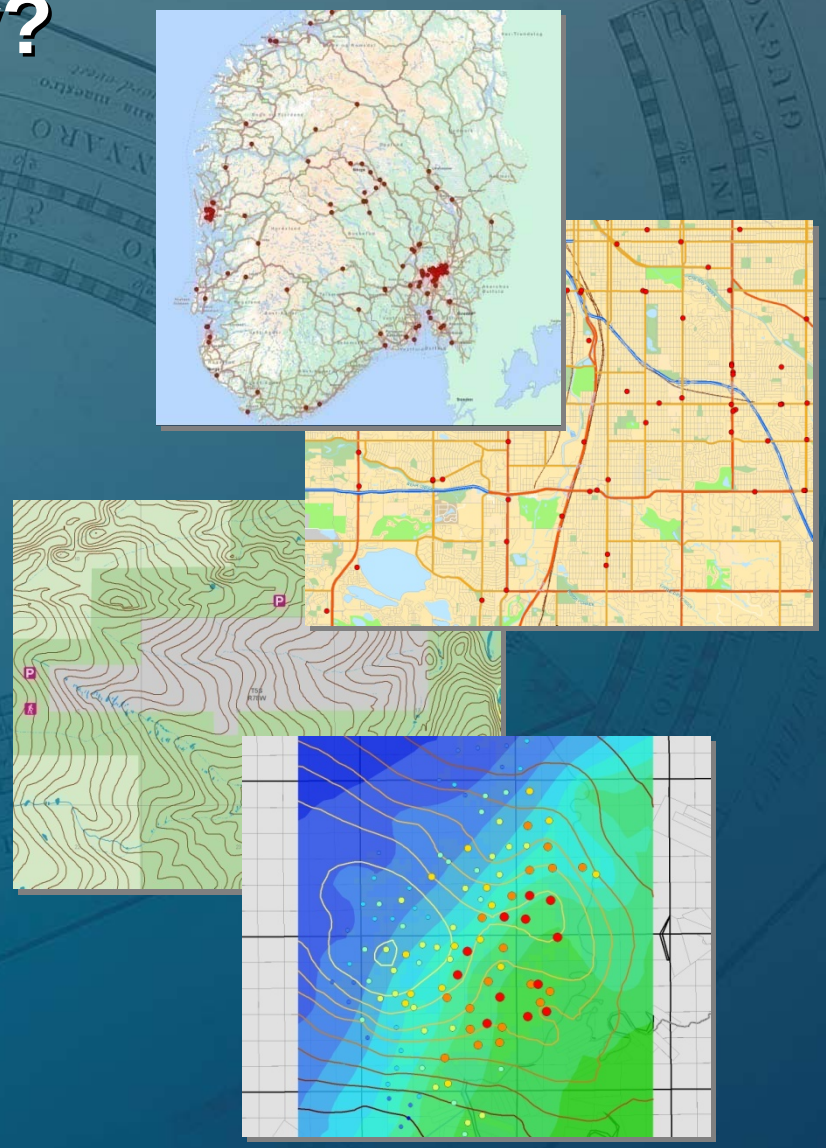
ACT on geographic knowledge

ASK geographic questions

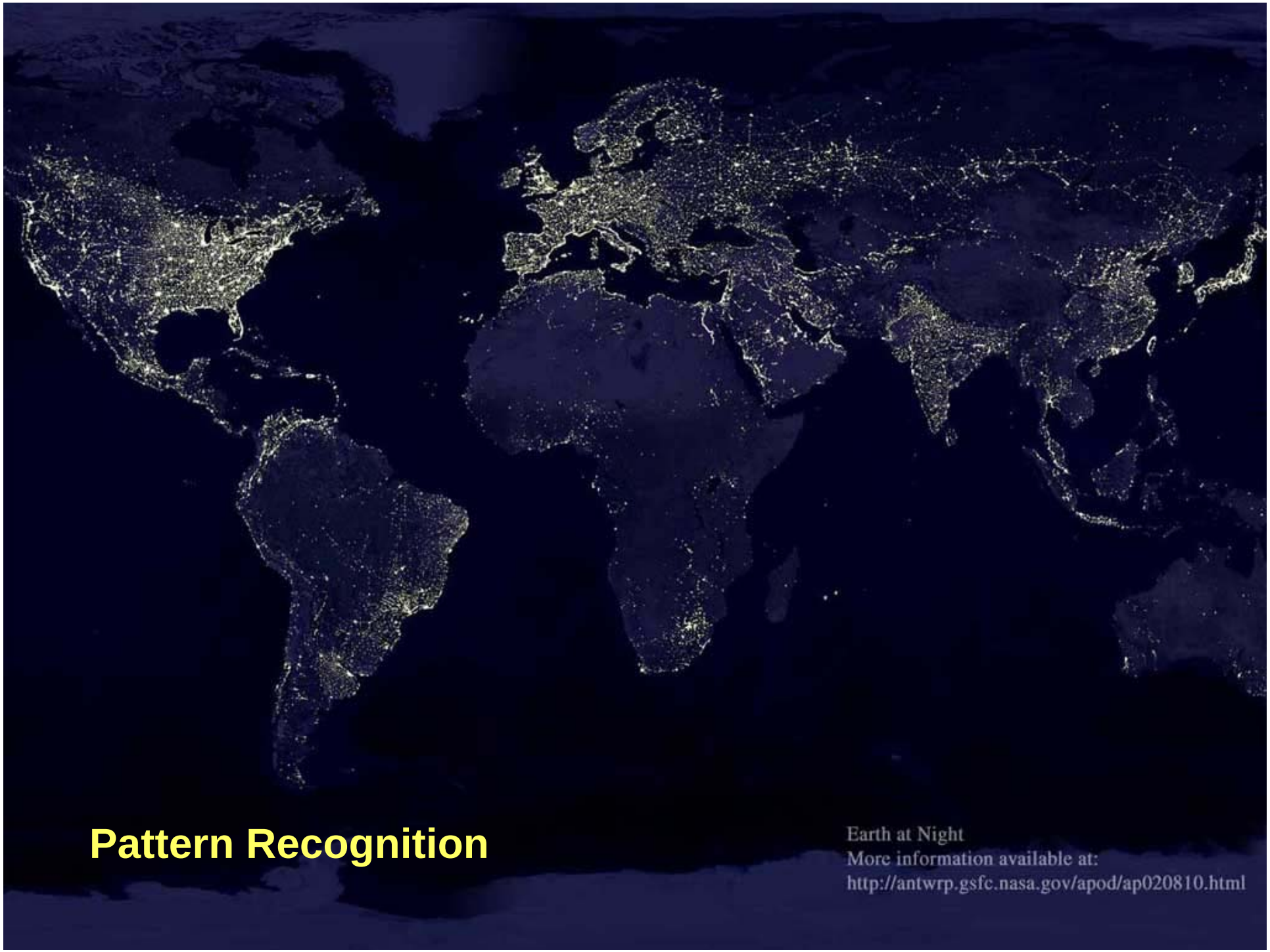
Can You Think Spatially?

Concepts of space

- Pattern Recognition
- Context & Content
- Space and Time
- Overlays
- 3D (multi-dimensions)
- Connectivity and Interaction



Explore your abilities…

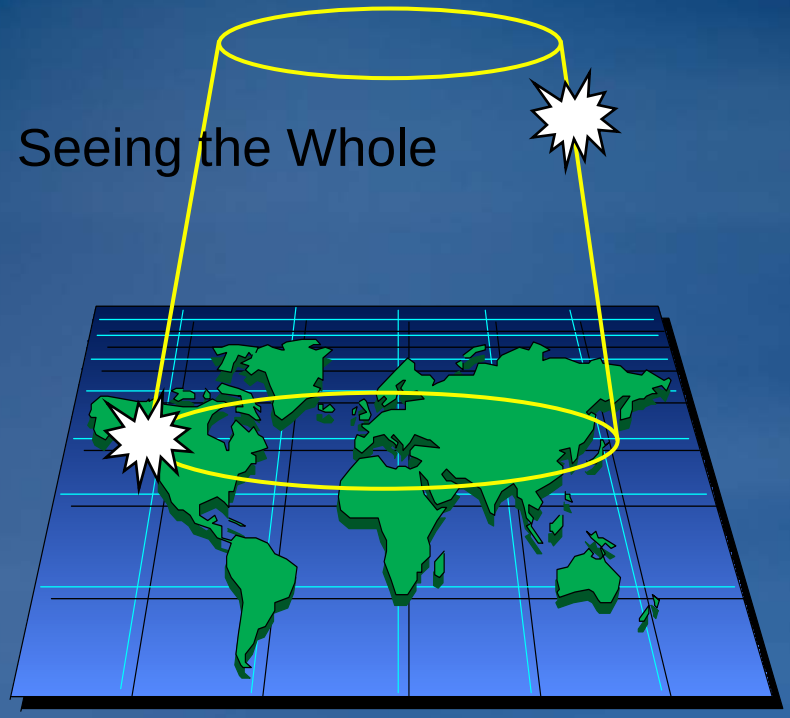

Pattern Recognition
Earth at Night
More information available at:
http://antwrp.gsfc.nasa.gov/apod/ap020810.html

Context and Content

Location - where is it?

Place – what is it like?

- Seeing the Whole



- **Patterns**
- **Linkages**
- **Trends**

- Managing Places

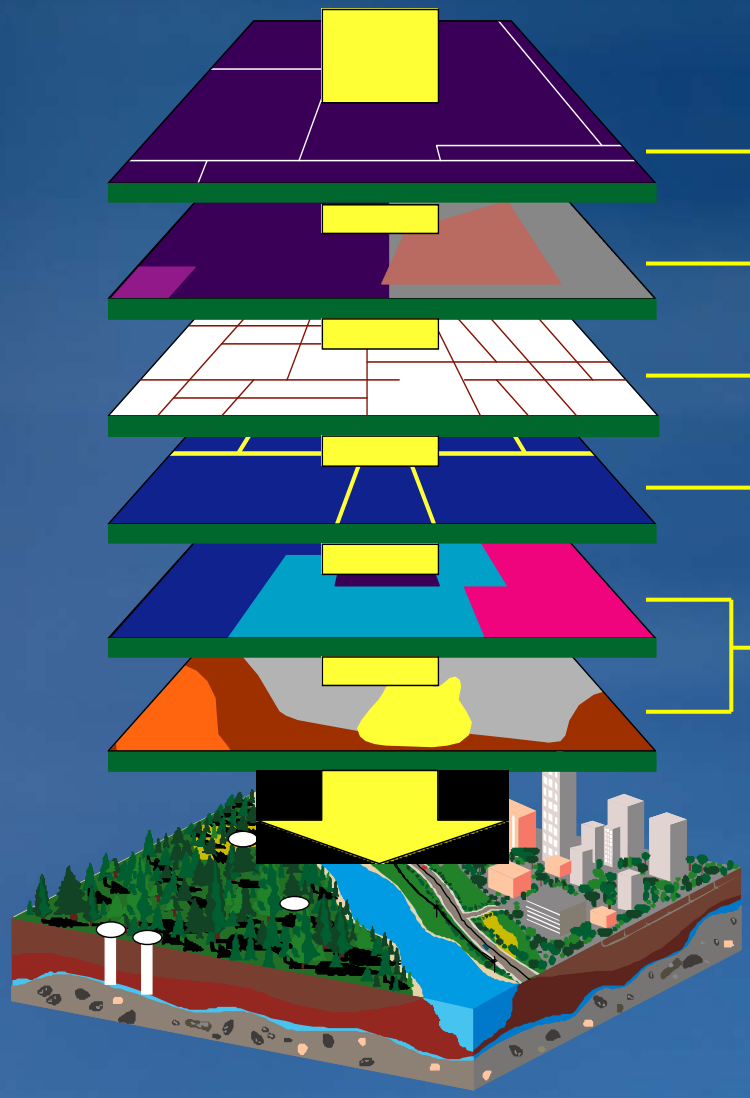
- **Watersheds**
- **Communities**
- **Neighborhoods**
- **Ecosystems**

Space & Time

Most applications integrate multiple spatial concepts to engage spatial reasoning to:

- **Detect changes in the uses of space**
- **Measure arrangements and clustering**
- **Document patterns over time to infer process**
- **Study flows as indicators of spatio-temporal interactions**
- **Assess space-time associations to test hypotheses**

Overlays



Population

Biodiversity

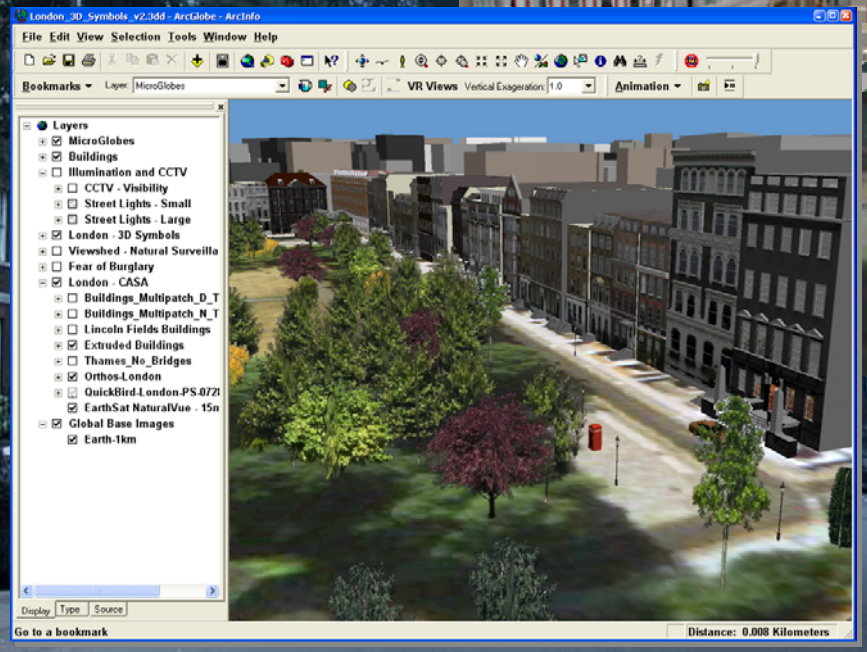
Geology

Land Use

Environmental Considerations

…from multiple perspectives and disciplines

Three Dimensions
the Geographic Approach



Summary: Can You Think Spatially?

- Pattern Recognition
- Proximity and Spatial Distances
- Space and Time
- Overlays
- 3D (multi-dimensions)
- Connectivity and Interaction

Geo-spatial Concepts for Spatial Reasoning

- **Location** – Understanding methods of specifying “where”
- **Distance** – Knowing importance of relative position
- **Network** – Understanding the importance of connections
- **Neighborhood & Region** – Drawing inferences from context
- **Overlays** – Inferring spatial associations
- **Scale** – Understanding spatial scale & its significance
- **Spatial Heterogeneity** – The implications of spatial variability
- **Spatial Dependence** – Understanding relationships across space
- **Objects & Fields** –continuous in space-time or as discrete

Spatial thinking is transformative

- Transcends disciplinary boundaries
- Unites quantitative and qualitative thinking
- Not necessarily easily and intuitively acquired
- Allies with graphic display and communication of information
- A domain of continuing significant knowledge development
- Value for daily living and for problem solving in both society and science

Don Janelle, UCSB

Disciplines claim uniqueness of theories, problems, and areas of application; yet also share fundamental objectives and methodologies

- **Sciences** seek identification and understanding of patterns and processes about the physical world and its phenomena
- **Social sciences** focus on interdependence among people & groups, grounded in place, space, & time and the need to understand patterns & processes of human behavior
- **Engineering and design sciences** focus on problem solving and product development that frequently entails the (re) arrangement of spatial entities and the consequences
- **Humanities** focus on human creativity and aesthetic renderings (stories, visualizations, sounds) that often affirm affinity to sense of place and regional identity, use spatial metaphor, and rely on spatialized languages for communication

Don Janelle, UCSB

Education

Reinforcing the geographic approach

- Earth Sciences
- Military
- Engineering
- Agriculture
- Public Health
- Social Science
- Geography
- Economics
- Architecture
- Planning
- Environmental Science
- Law Enforcement
- Business
- Computer Science
- Graphic Arts
- Humanities
- Natural Resources

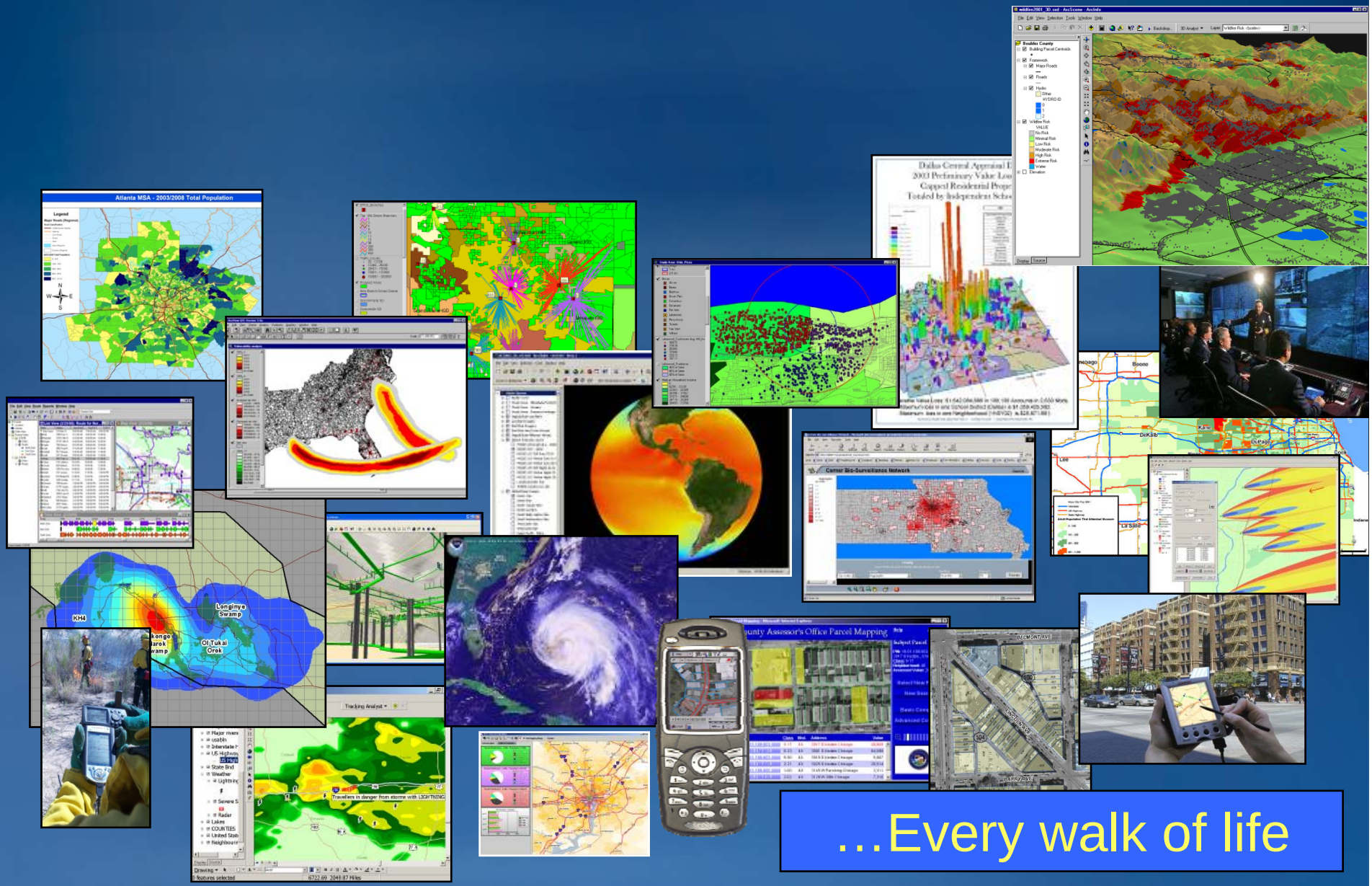
“Thinking about Technology”

Foundations of the Philosophy of Technology

by

Joseph Pitt

Thinking Spatially – everything and everywhere



THANK YOU!

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