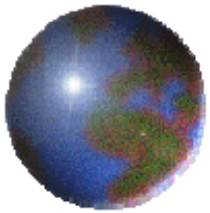


13. Geovisualization

Geographic Information Systems and Science

SECOND EDITION

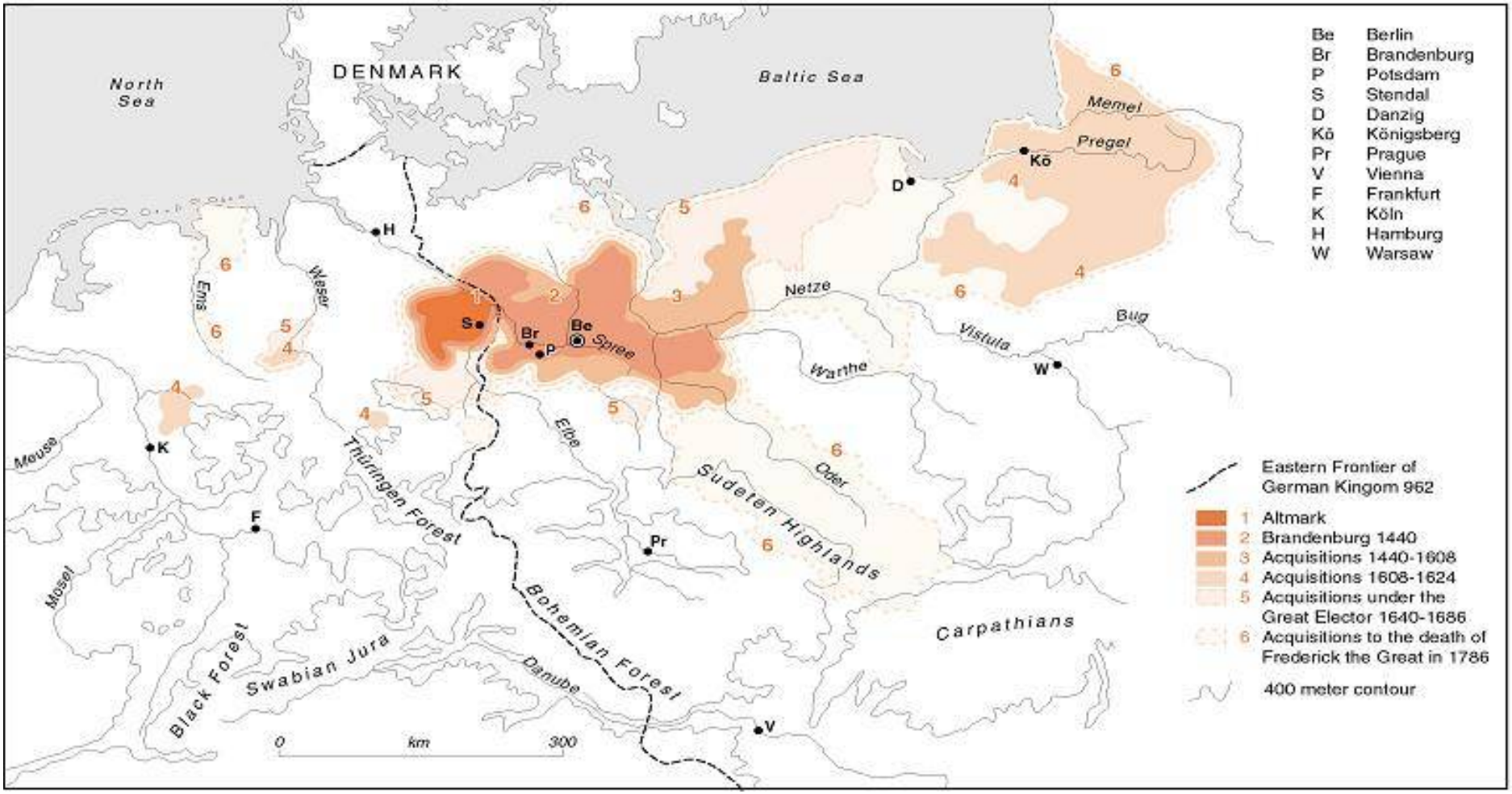
Paul A. Longley, Michael F. Goodchild, David J. Maguire, David W. Rhind

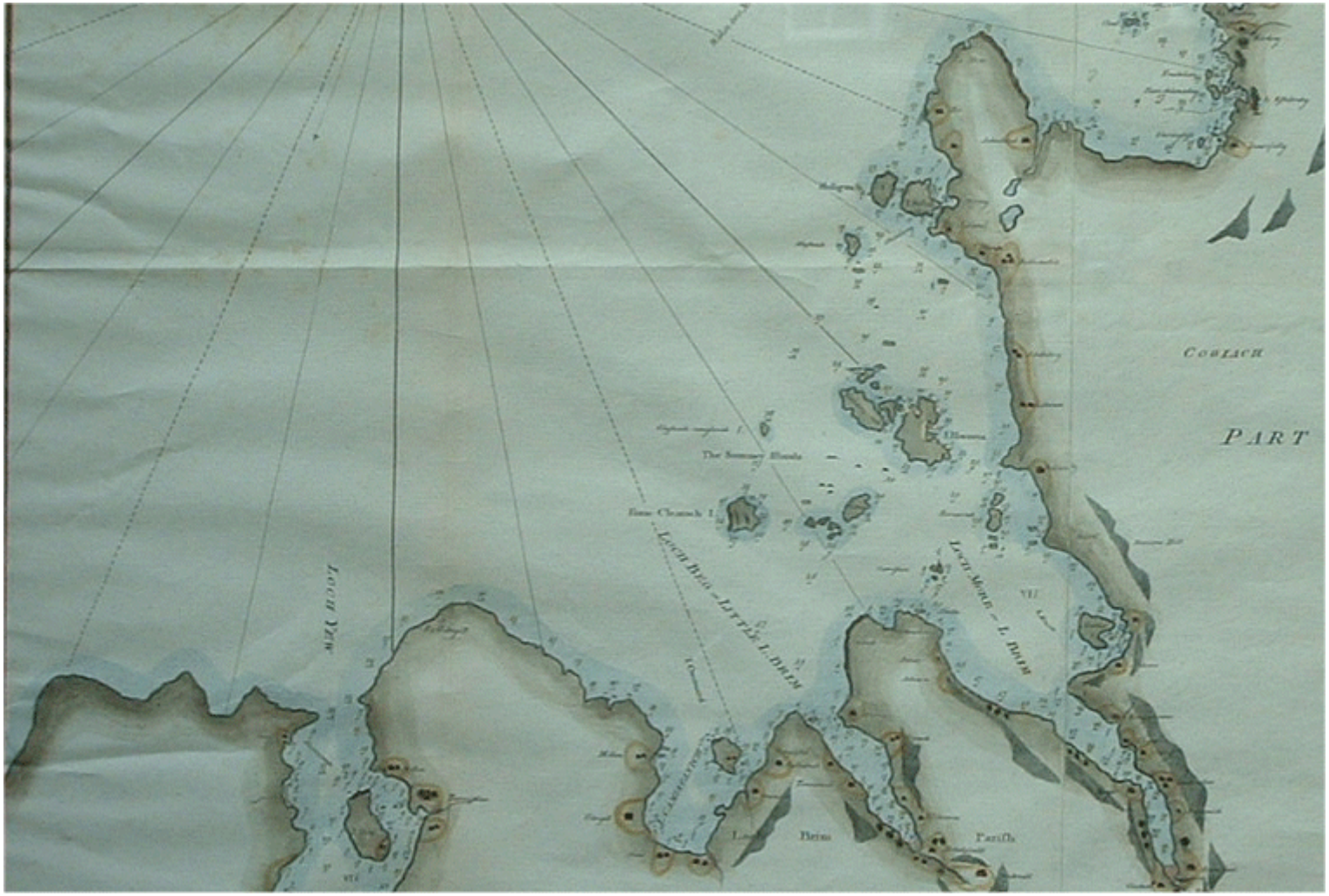
Overview

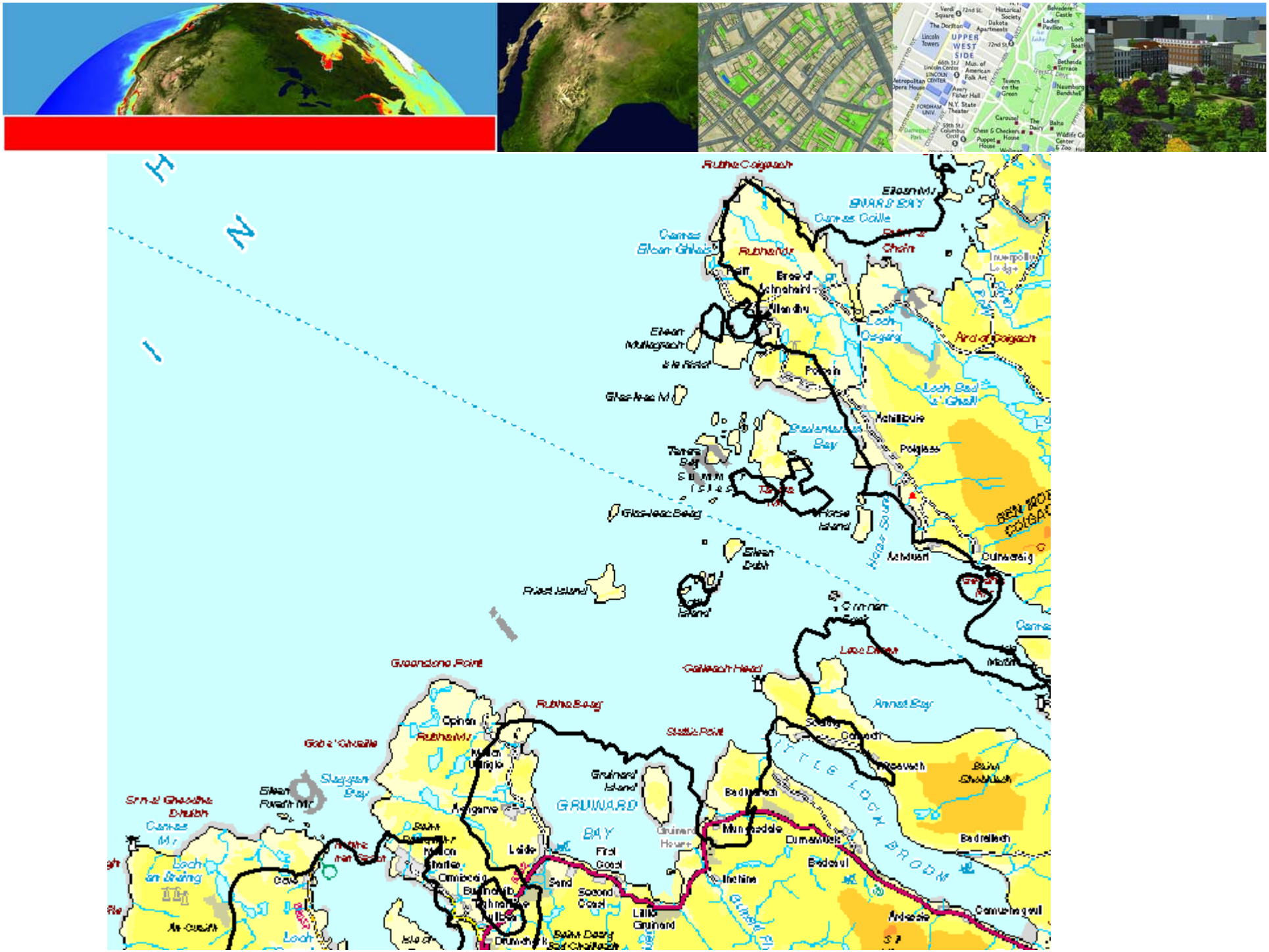
- How GIS affects visual communication
- User interfaces and spatial query
- How GIS-based representations may be transformed
- How 3-D geovisualization and VR help us to understand the world

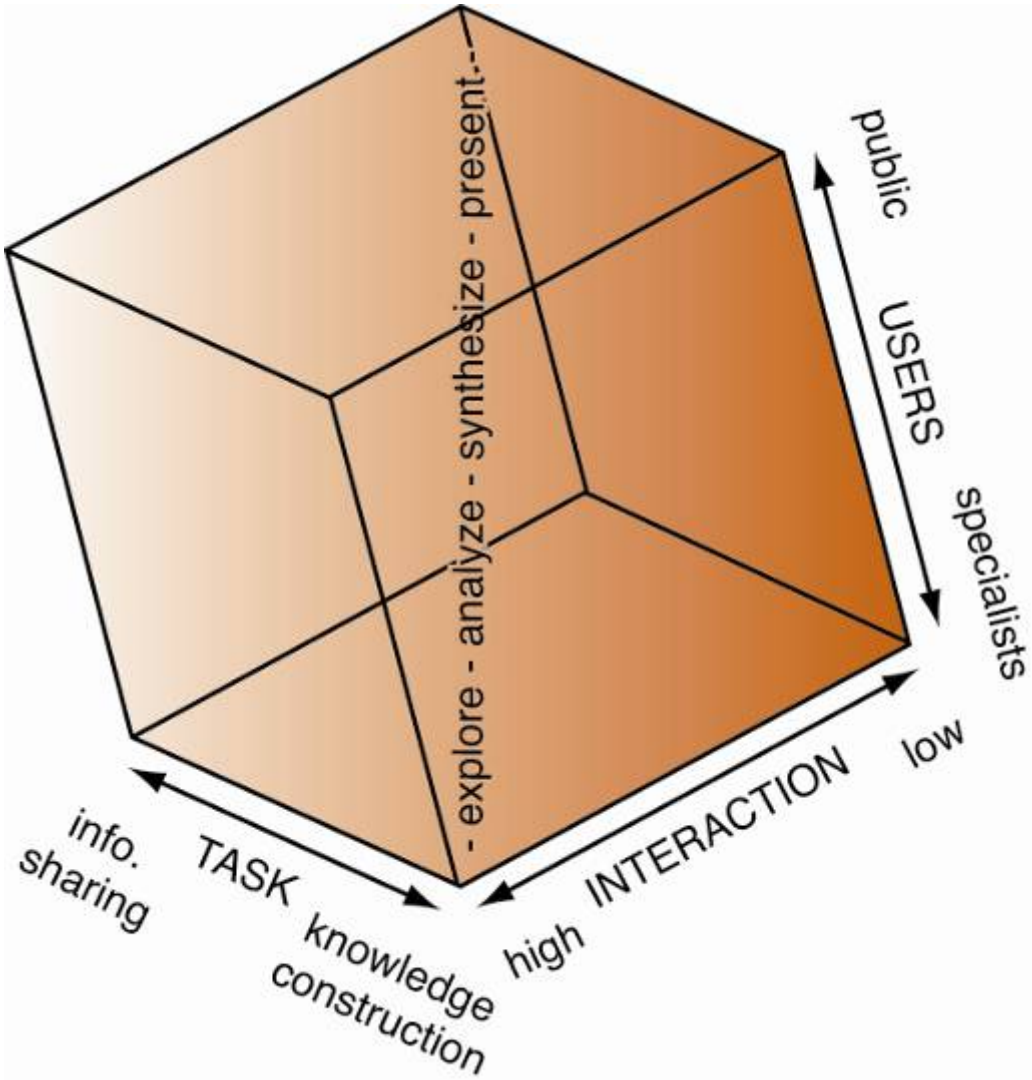
Geovisualization and GIS

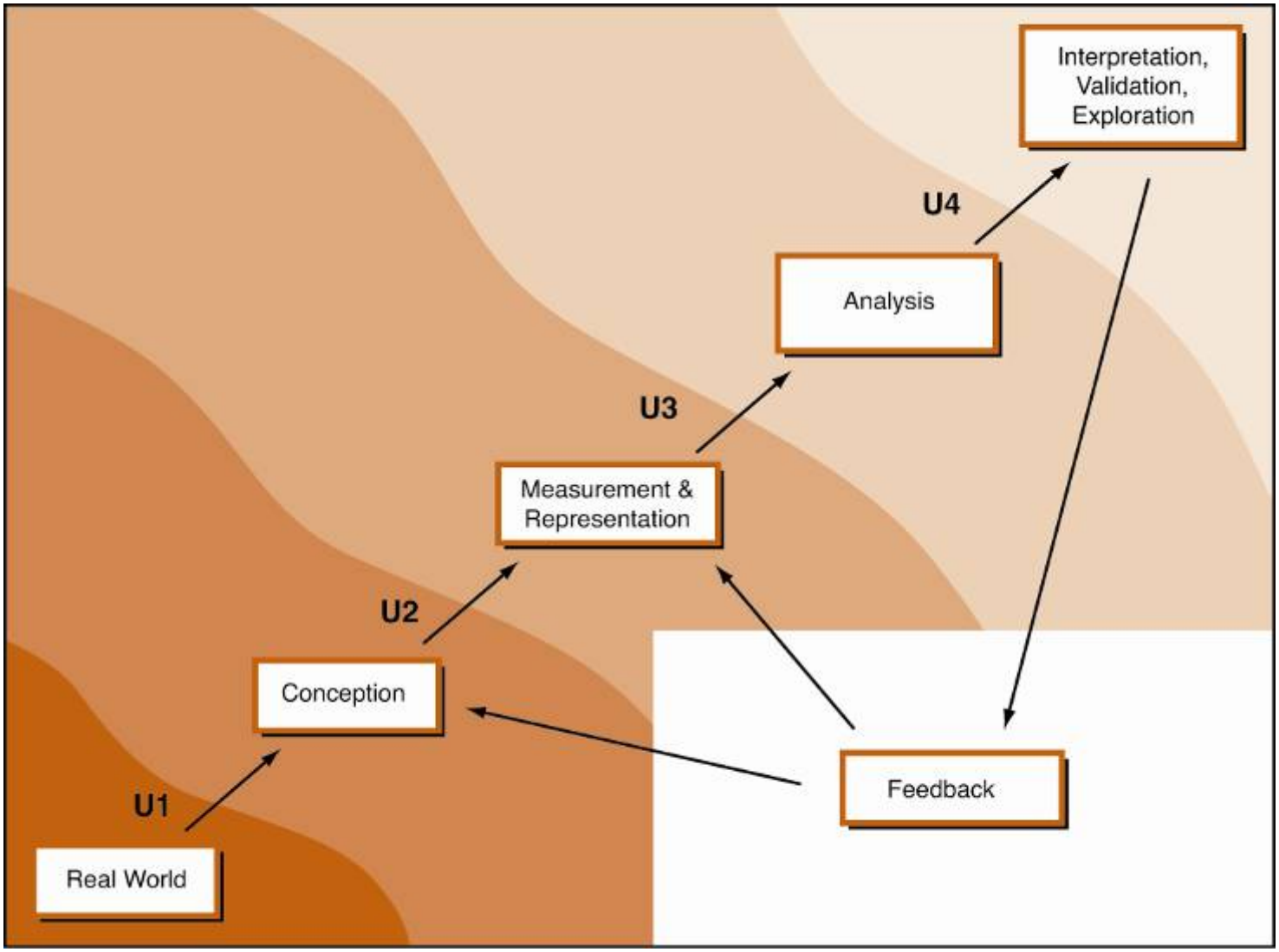
- Maps are important decision support tools
  - E.g. GIS and geopolitics
  - Historic role of paper mapping
- GIS and geovisualization: ViSc, catrography, image analysis, etc.
  - The ICA Commission on Visualization and Virtual Environments






UPPER WEST SIDE
GRUINARD BAY
GRUINARD BAY
LITTLE LOCH BROOM

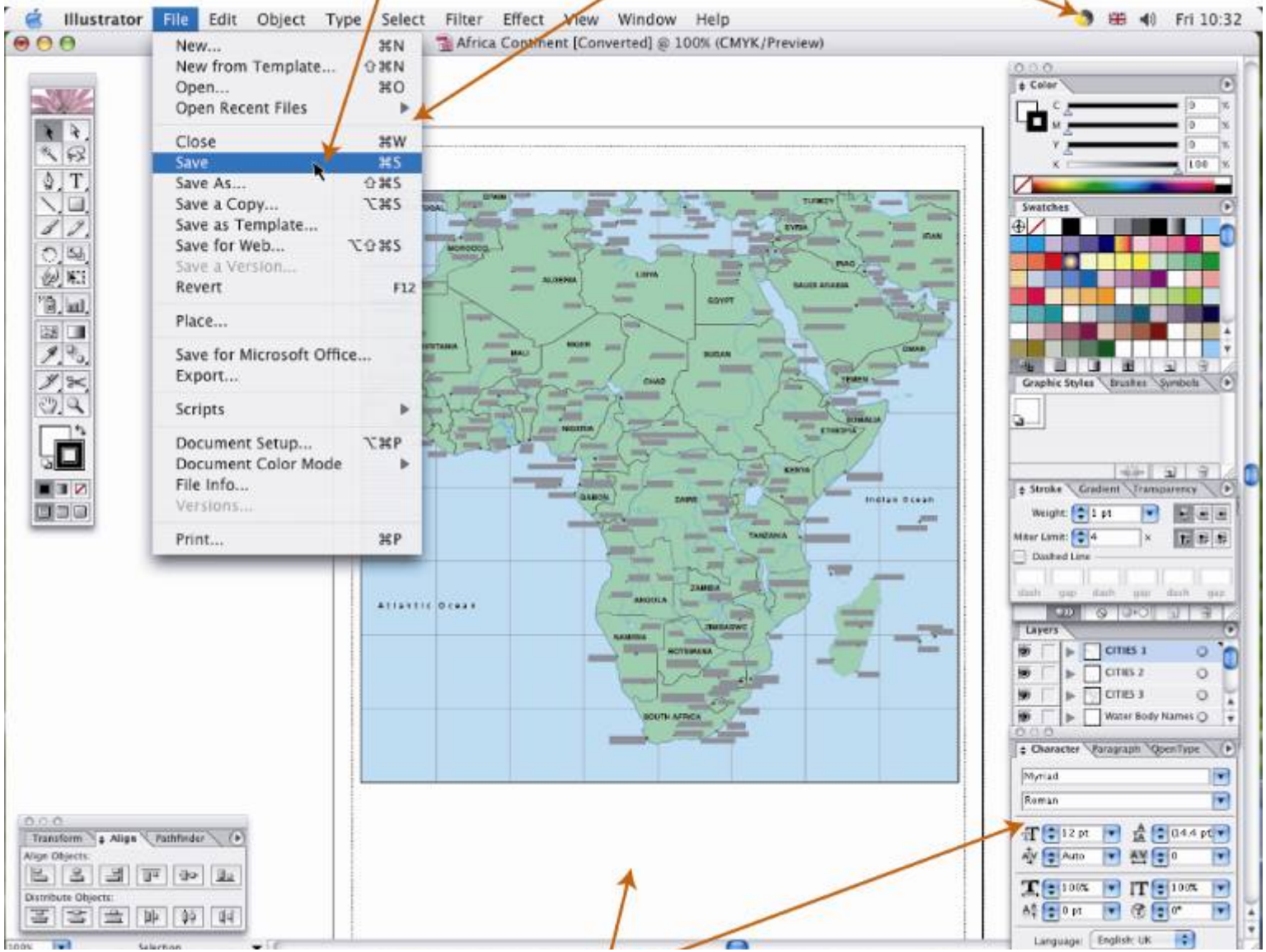




Spatial query

- Improved ability to explore, synthesize, present, and analyze
- The WIMP interface: pointing, clicking, and dragging windows and icons
- Dynamic updates

POINTER DROP DOWN MENU ICONS



ROMANSE

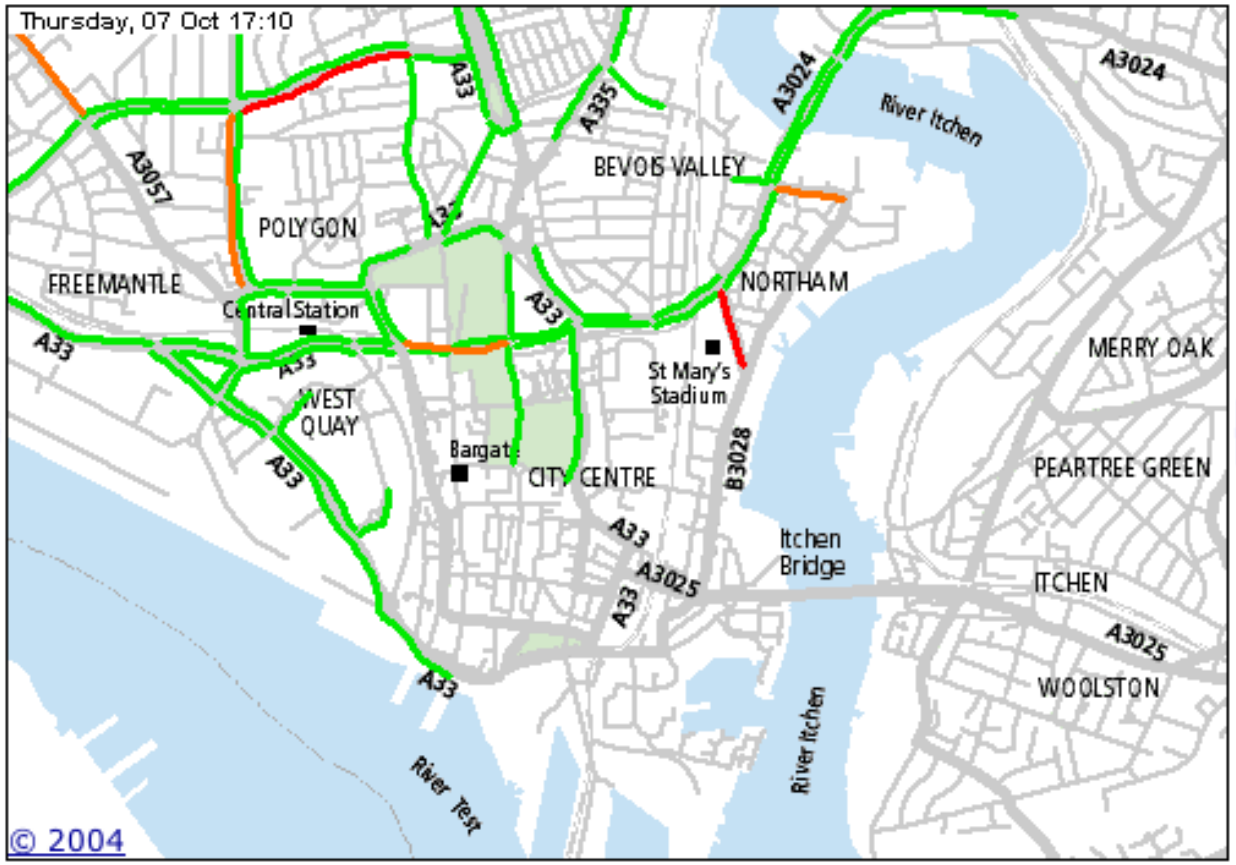
Traffic and Travel information for Southampton

SOUTHAMPTON CITY COUNCIL

- Home
- Areas
- Travel News
- Planned Roadworks
- BBC Weather
- Cycling
- Links
- About us
- Contact us
- Disclaimer

City Centre

Key Help



Powered by SIEMENS

Zoom out

Mode

Maps

Schematics

Themes

Car Parks

CCTV

Incidents and Congestion

Special Events

Traffic News

Bridge Maintenance on A33 Millbrook Road

Woodmill Lane

Hampshire County Council

SOUTHAMPTON CITY COUNCIL

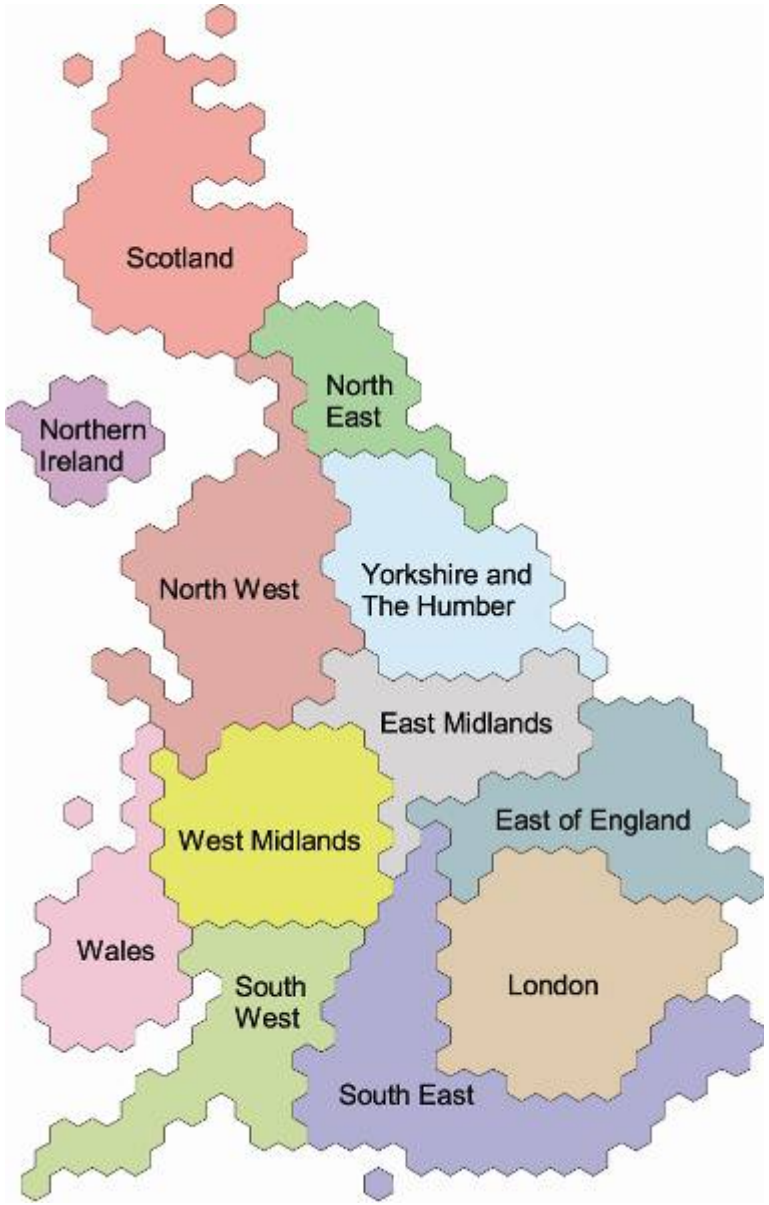
Portsmouth CITY COUNCIL

Transformation

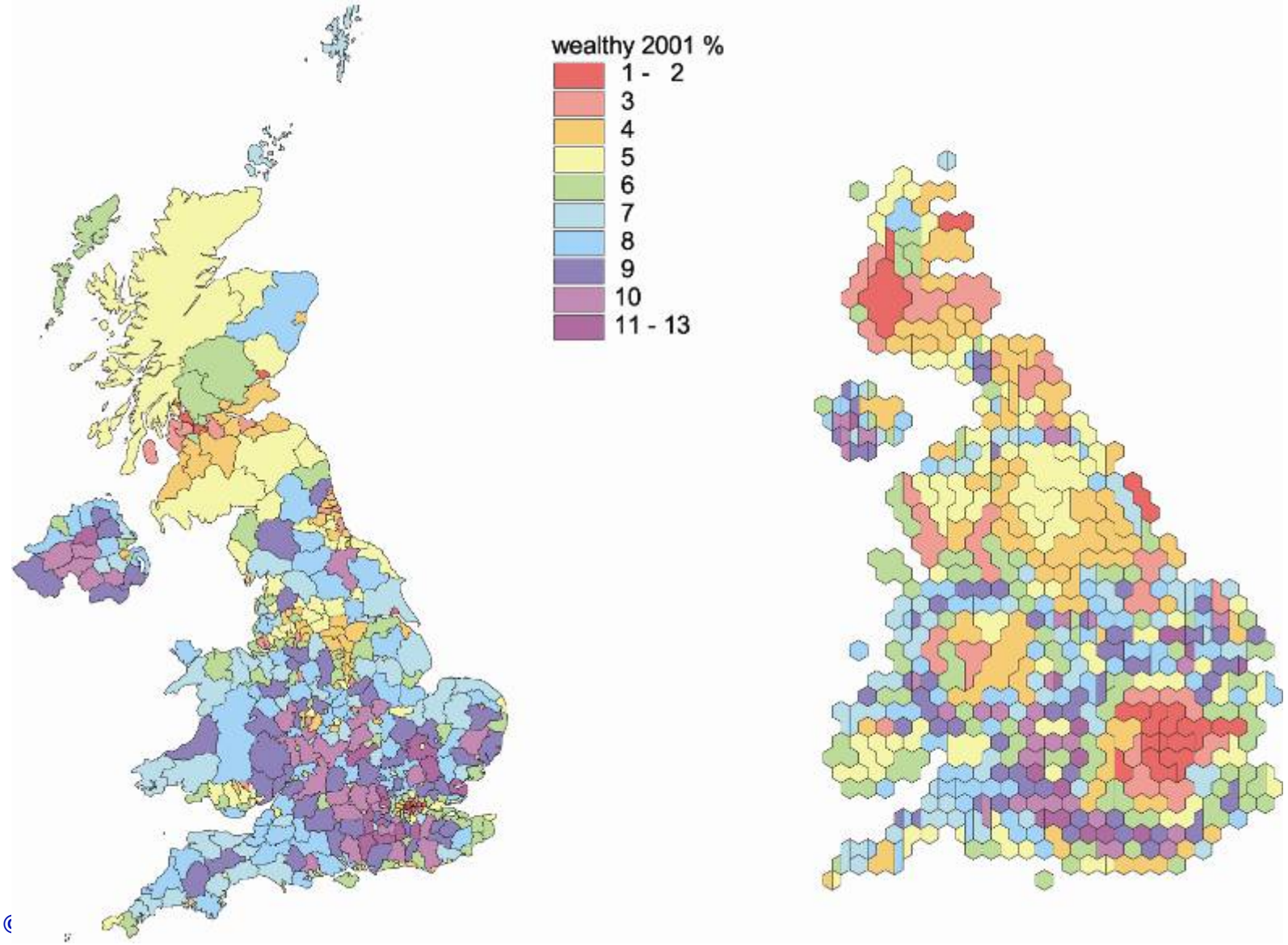
- Cartograms distort area or distance in order to achieve a specific objective
- Dasymetric maps use the intersection of two datasets (or layers in the same dataset) to obtain more precise estimates of a spatial distribution


UPPER
WEST
SIDE


Scotland
Northern Ireland
North East
North West
Yorkshire and The Humber
East Midlands
West Midlands
Wales
East of England
London
South East
South West


Scotland
Northern Ireland
North East
North West
Yorkshire and The Humber
East Midlands
West Midlands
East of England
Wales
South West
London
South East


Verdi Square
72nd St.
Historical Society
Belvedere Castle
The Dorilton
Dakota Apartments
Ladies Pavilion
Lincoln Towers
UPPER WEST SIDE
72nd St.
Loch
Boat
66th St./ Lincoln Center
LINCOLN CENTER
Mus. of American Folk Art
Bethesda Terrace
Metropolitan Opera House
Avery Fisher Hall
Tavern on the Green
Naumburg Bandshell
FORDHAM UNIV.
N.Y. State Theater
Carousel
The Dairy
Balto
59th St./ Columbus Circle
Chess & Checkers House
Puppet House
Wildlife Center & Zoo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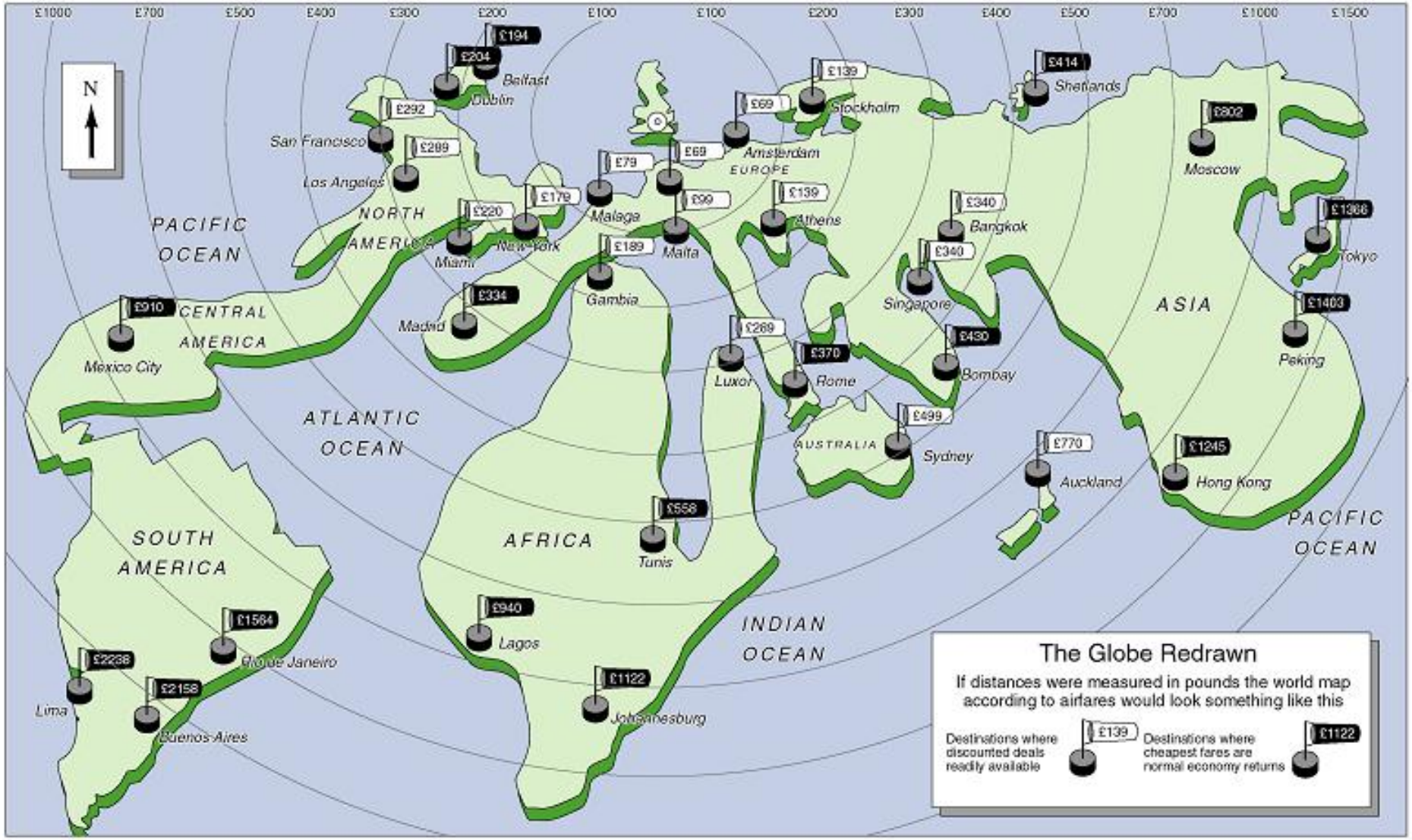

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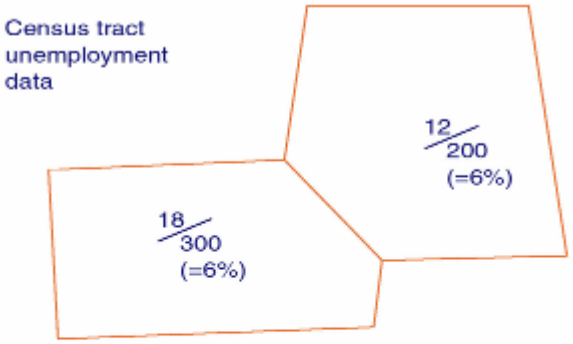

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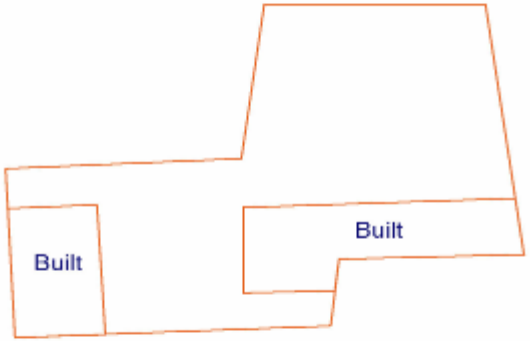

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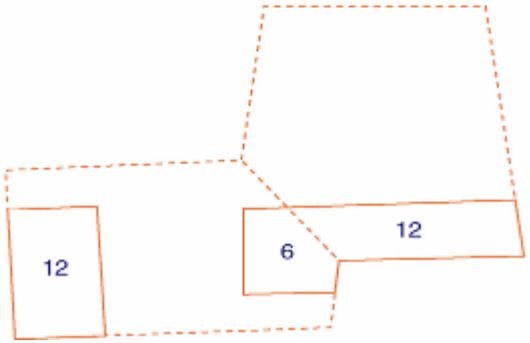
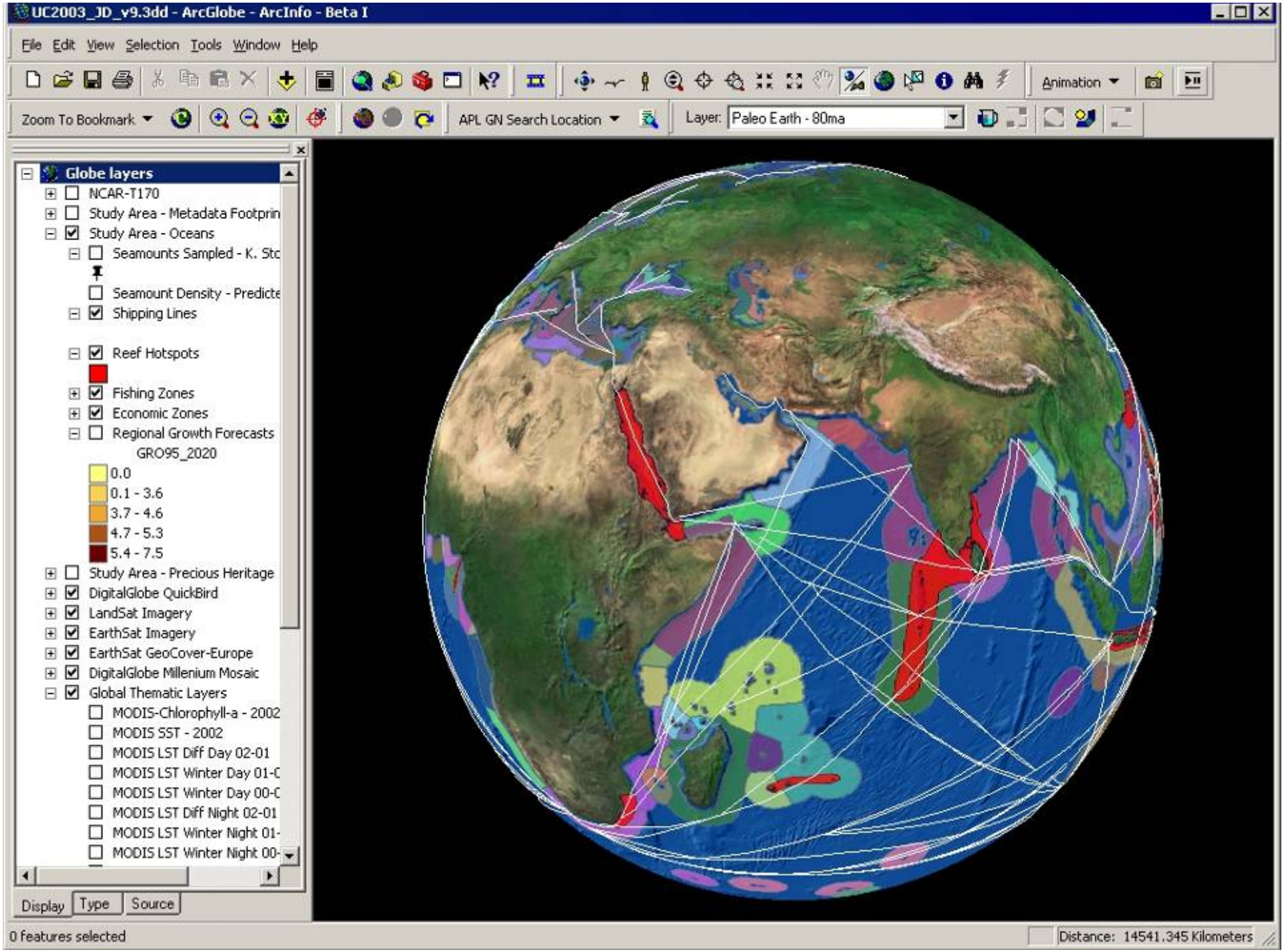


Immersive interaction and PPGIS

- ViSc: use of new technology and media to convey multifaceted messages
  - Better understanding of data and models leads to better understanding of real-world patterns and processes
- PPGIS may be reinforced through field computing

3-D GIS and VR systems

- Facilities to:
  - Take different views
  - Fly-throughs
  - Reposition or rearrange
  - Interact as avatars in virtual worlds
  - Develop new representations
  - Create immersive and semi-immersive VR systems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Shipping Lines
Reef Hotspots
Fishing Zones
Economic Zones
Regional Growth Forecasts
GRO95_2020
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0.1 - 3.6
3.7 - 4.6
4.7 - 5.3
5.4 - 7.5
Study Area - Precious Heritage
DigitalGlobe QuickBird
LandSat Imagery
EarthSat Imagery
EarthSat GeoCover-Europe
DigitalGlobe Millenium Mosaic
Global Thematic Layers
MODIS-Chlorophyll-a - 2002
MODIS SST - 2002
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MODIS LST Winter Day 01-C
MODIS LST Winter Day 00-C
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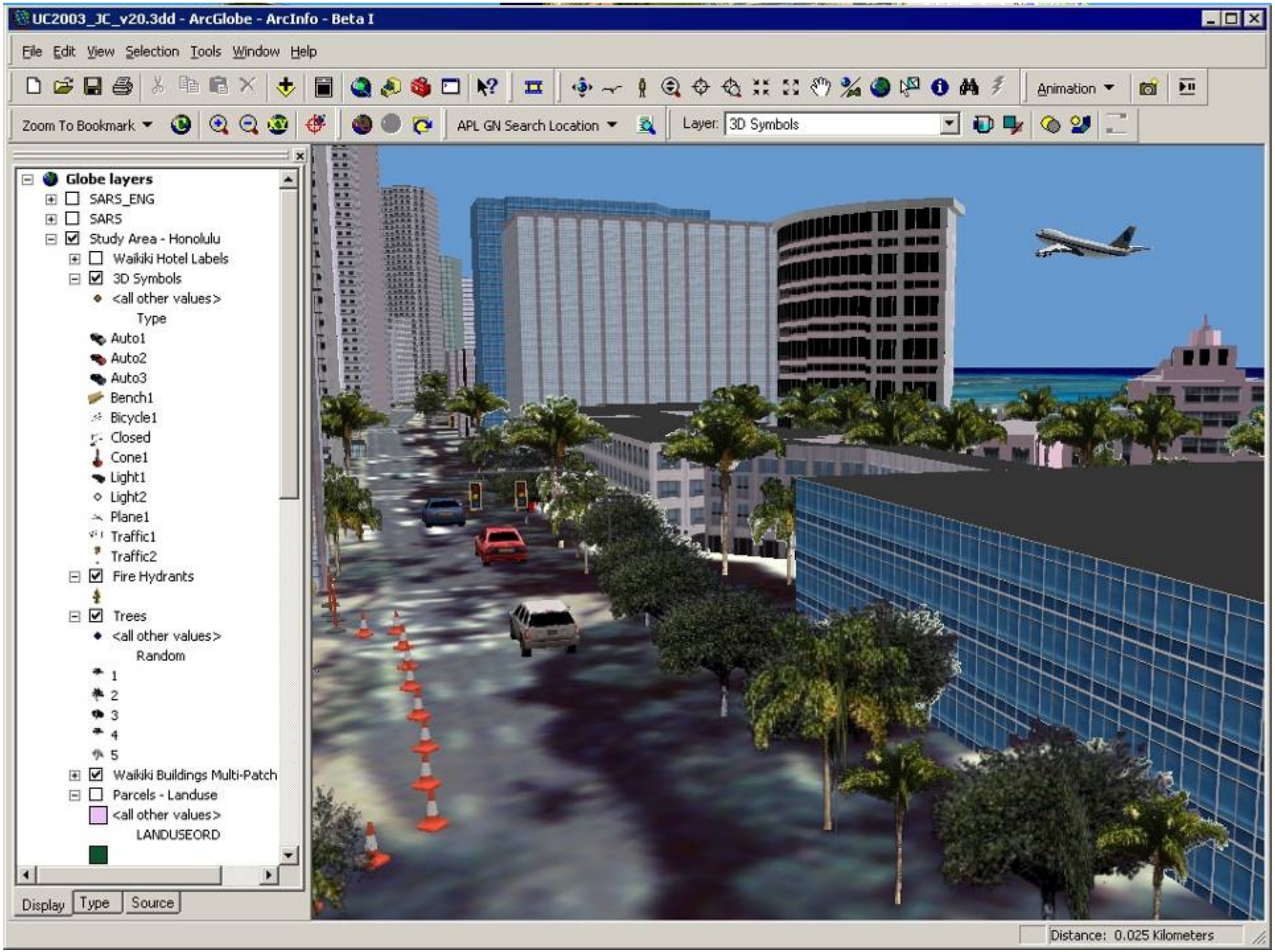
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Study Area - Honolulu
Waikiki Hotel Labels
3D Symbols
<all other values>
Type
Auto1
Auto2
Auto3
Bench1
Bicycle1
Closed
Cone1
Light1
Light2
Plane1
Traffic1
Traffic2
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<all other values>
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Waikiki Buildings Multi-Patch
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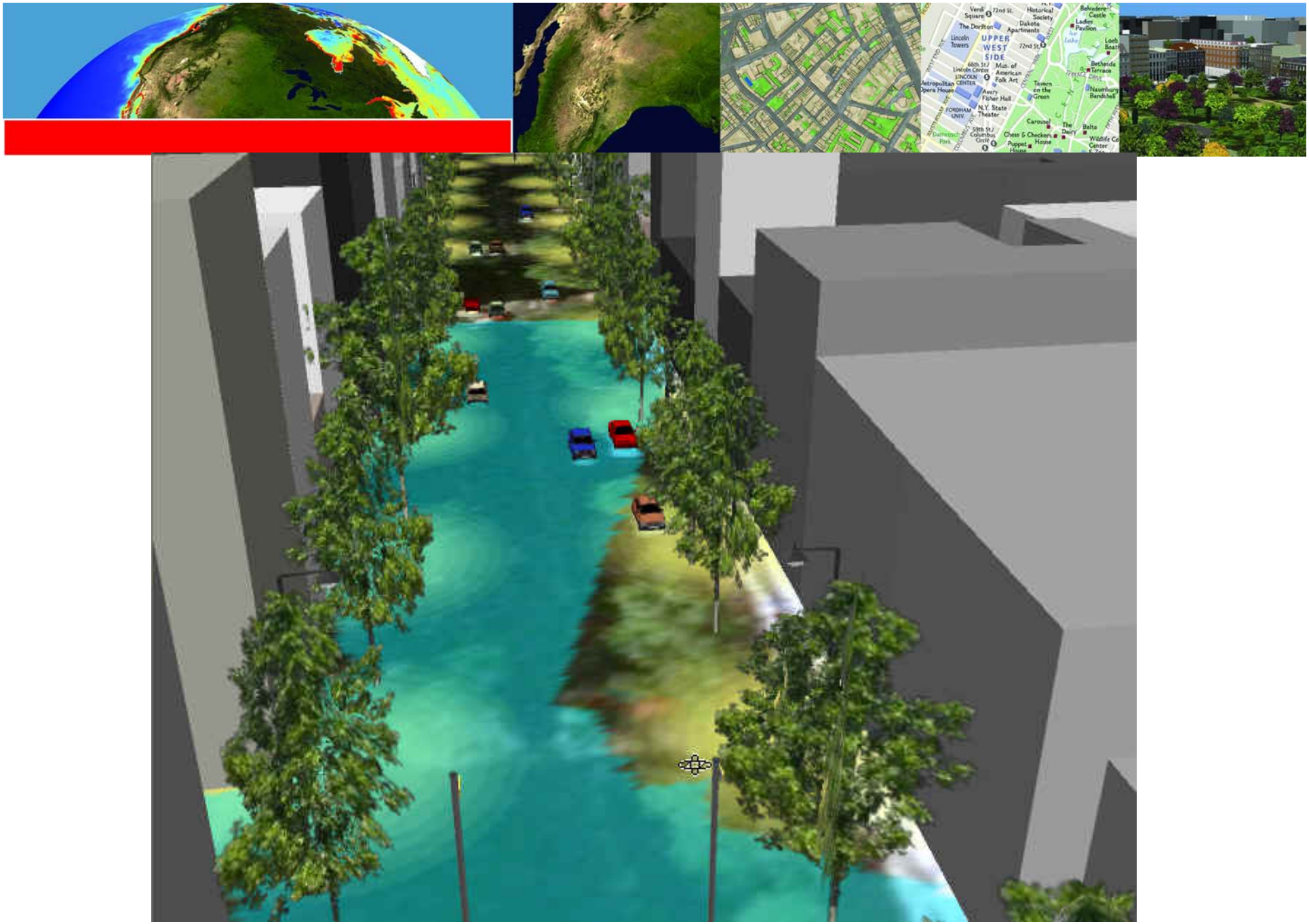

Consolidation

- ViSc in simulation and decision-making
  - The medium and the message
  - Clarifying or obscuring the message
- Data quality must be up to the applications task
- ‘Seeing is believing’
  - Is it?
  - Should it be?