

ESRI Perspective on Dynamic GIS

Where we are, how you can help

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Overview

- New temporal functionality in ArcGIS 9.2
- Data Integration and Synthesis
- Visualization and Exploration
- Query and Analysis

Data Integration and Synthesis

■ Data Access

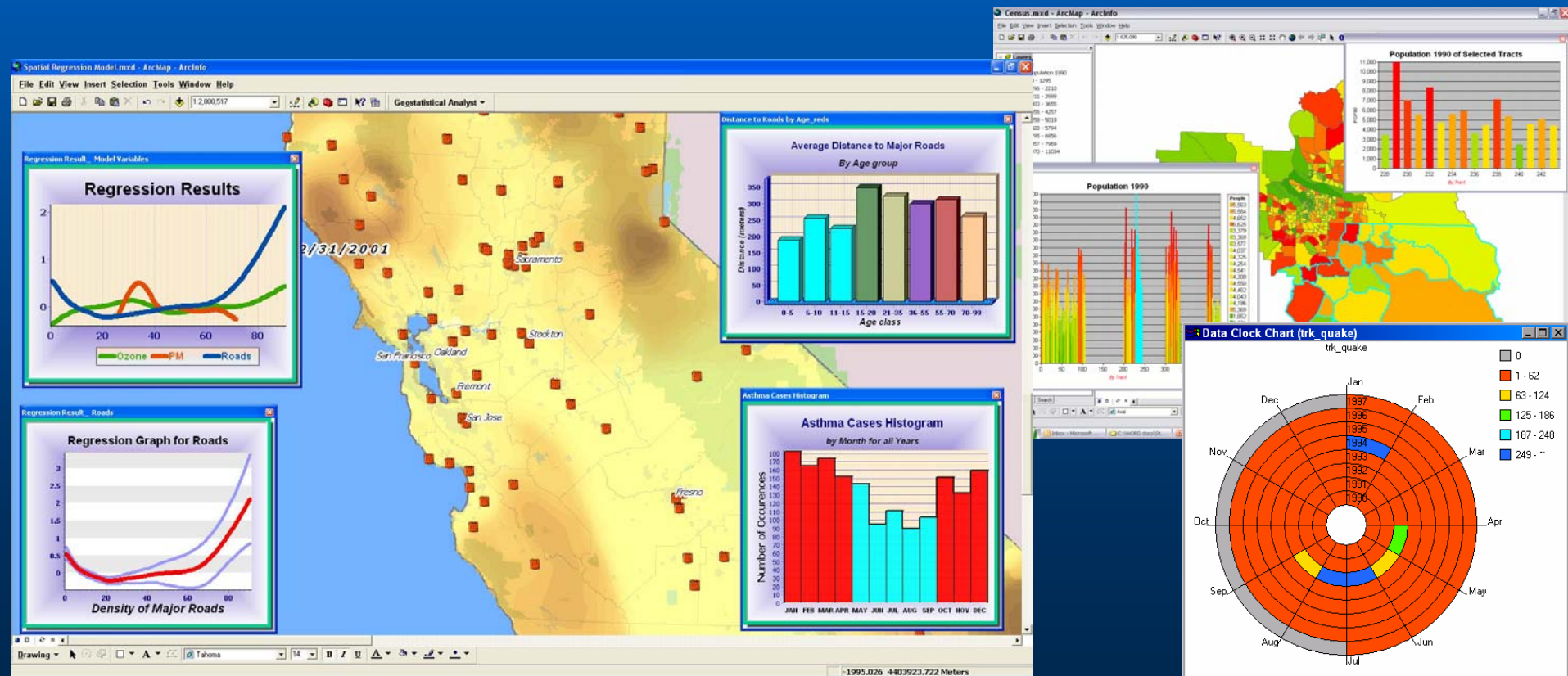
- Vector and DBMS temporal data
- Temporal image collections
- Multidimensional array (field data)
 - Used primarily by fluid Earth modelers
 - netCDF, HDF, GRIB
 - netCDF CF1 part of NATO standard and OGC testbed project

■ Data Management

- First role of GIS is data synthesis
 - Temporal data is often non-standard and messy
 - *Need for new research and tools*
 - Need standard spatiotemporal reference frame
 - Time format, units, sampling, range, precision, ...
 - Spatiotemporal resampling, aggregation, disaggregation, synchronization, gap filling, ...

Visualization and Exploration

- Linking and brushing between multiple views (maps, graphs, tables).
- Application clock for temporal sequencing and animation
- *New visualization techniques specific to dynamic or temporal data...*



Query and Analysis

- Simplify the creation of efficient spatiotemporal queries
- Simulation modeling
 - Generating a collection of realizations of a process
 - New 9.2 tools for creating iterative models and generating random data
 - Agent Based Modeling – REPAST and Agent Analyst
 - Temporal/Iterative Map Algebra – PCRASTER
 - ... some future simulation modeling framework
- Multidimensional analysis
 - Visualization and analysis of observational data and simulation results to discover patterns and relationships
 - *Need research into new tools for discovering spatiotemporal patterns in point, line, and field data*

Spatiotemporal Examples

Animations / Movies

- A new medium for sharing of spatiotemporal information
 - Everyone's PC can read an AVI or MOV file
 - Much smaller than source data
 - Like a good map, it focusses on a purpose to convey a message and employs good cartographic concepts
- Also needs some understanding of cognitive perception of time and change to be effective
- *Just as there is research and publication in cartography, there could also be in the conveyance of spatiotemporal information*