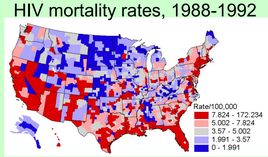
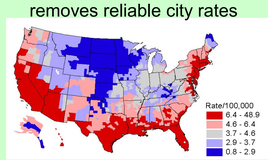
III. Geovisualization Tools Development

Weighted Nonparametric Smoothing (Headbanging)

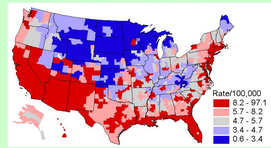
Original data
HIV mortality rates, 1988-1992



Unweighted smoothing
removes reliable city rates



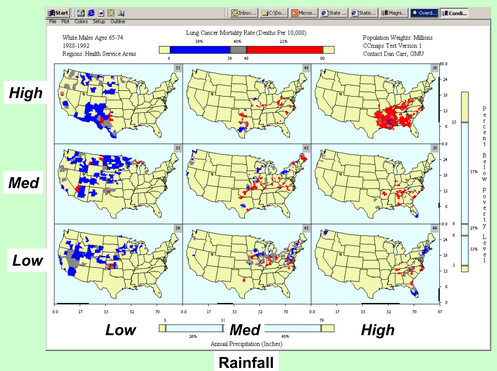
Weighted smoothing
retains reliable rates



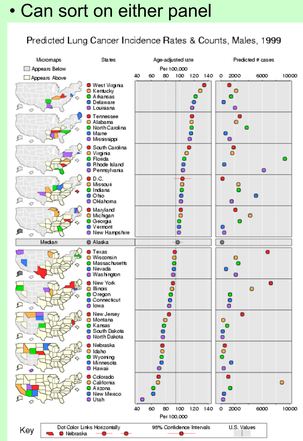
Data: *Pickle et al., Atlas of United States Mortality, NCHS, 1996.*
Headbanging: *Mungiole et al.,Statistics in Medicine, 1999*

Conditioned choropleth maps*
- Decompose a single map into strata according to 1 or 2 other factors
- Let users control classifications (high, medium, low) with sliders

Lung cancer mortality rate



Linked micromap plot*
- Links statistical graphs & maps by color
- Can sort on either panel



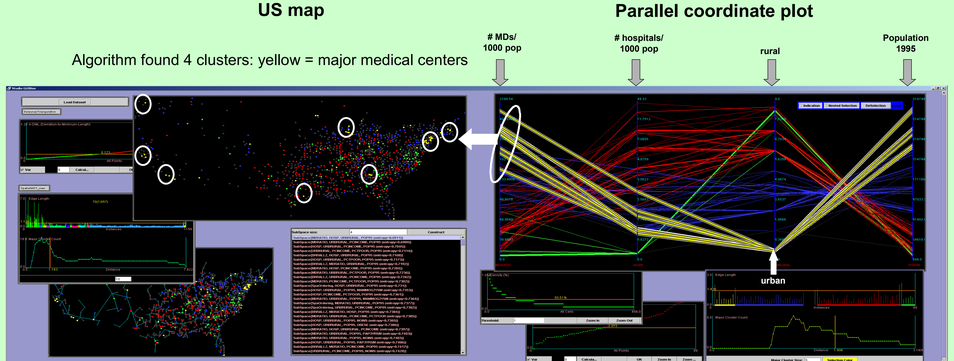
Carr, Wallin, and Carr, Statistics in Medicine 2000

Combining statistical clustering algorithms with new visualization tools

US map

Algorithm found 4 clusters: yellow = major medical centers

Parallel coordinate plot

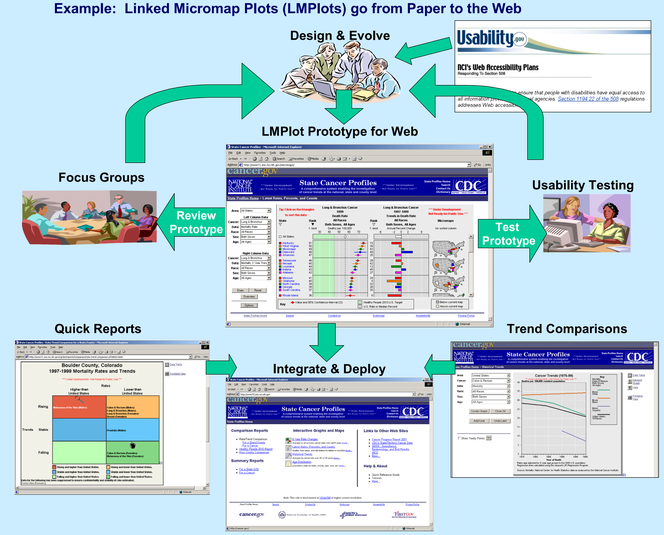


Alan MacEachren, Diansheng Guo, Penn State University (NSF & NCI grants); see www.geovista.psu.edu/grants/dg-gg/

IV. Communication of georeferenced statistics

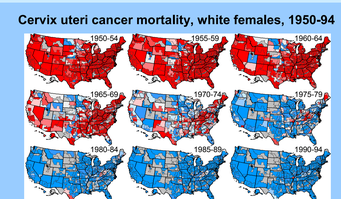
A. State Cancer Profiles
- **Goal**: Focus cancer control efforts on places and persons who can most benefit.
- **Audience**: Health planners, policy makers, and advocates.
- **Approach**: Use interactive data visualization tools to explore the U.S. cancer burden.

Example: Linked Micromap Plots (LMPlots) go from Paper to the Web



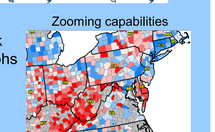
B. Cancer mortality atlas
(*cancer.gov/atlasplus/*)

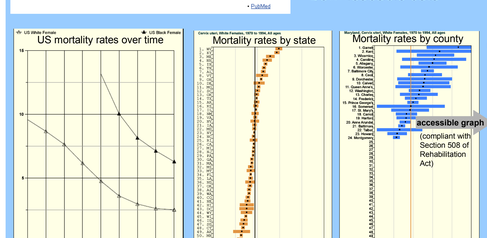
Cervix uteri cancer mortality, white females, 1950-94



- Electronic version of book
- Dynamic, accessible graphs
- Interactive maps
- Downloadable data

Zooming capabilities





V. GIS grants program

12 grants funded under new program: Geographic-based research in cancer control and epidemiology (see *epi.grants.cancer.gov/GIS.html)*

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