Geotechnology

…not your grandfather's map

Potential and Pitfalls of Applying Map Analysis in Natural Resources

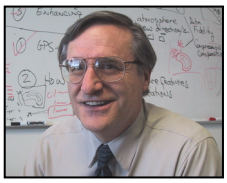
Pingree Park Alumni Reunion, August 8-10, 2008

Presented by **Joseph K. Berry**, MS in Business Management '72 and PhD emphasizing Remote Sensing '76

Forestry and Natural Resources were early users and developers of Geographic Information Systems (GIS) technology. Today, the U.S. Department of Labor recognizes Geotechnology as one of the three "mega-technologies for the 21st century" with the other two being Biotechnology and Nanotechnology. Whereas the early uses of GIS focused on inventory and mapping (*Where* is *What*), contemporary applications in many fields have evolved to analyzing spatial patterns and relationships (*Why* and *So What*). This transition from "Mapping" to "Map Analysis" is revolutionizing natural resources research, planning and management. Techniques in Spatial Statistics support a new perspective of mapped data and new map-ematical and statistical tools that extend the traditional non-spatial analysis and modeling most of us learned in school as "central tendency" theory expressed as the Average and Standard Deviation describing the typical condition over an area. From this new perspective, maps are viewed as organized sets of numbers and the detailed spatial distributions augment the traditional numerical distributions used in data analysis. Techniques in Spatial Analysis support entirely new concepts, such as landscape fragmentation, variable-width buffers, visual exposure and optimal paths, that analyze the coincidence and context among map layers for better understanding of complex natural systems. This presentation investigates the similarities and differences between the traditional and new set of data analysis tools, their current application in related fields, such as Precision Agriculture, and future directions of Geotechnology for Natural Resources.

Further Reading:

- **http://www.nature.com/nature/journal/v427/n6972/full/nj6972-376a.html** …article in Nature describing *Geotechnology* as one of the three "mega technologies" for the 21st Century.
- **http://www.innovativegis.com/basis/Papers/Other/Geotechnology/Geotechnology_history_future.htm** ...a white paper titled "*A Brief History and Probable Future of Geotechnology*."
- **http://www.innovativegis.com/basis/present/GW05_wildfire/Wildfire_GW05.htm** ...feature article entitled "*Quantifying Wildland Fire Risk*" describing a risk-assessment framework that incorporates spatial and temporal factors.
- **http://www.innovativegis.com/basis/present/GW98_PrecisionAg/GW98_PrecisionAg.htm** ...feature article entitled "*Who's Minding the Farm*" discussing Precision Ag principles and approaches.
- **http://www.innovativegis.com/basis/Papers/Online_Papers.htm** …listing of several papers on the concepts, considerations, procedures and applications of Geotechnology and Map Analysis.
- **http://www.innovativegis.com/basis/MapAnalysis/Default.htm** ...online book, Beyond Mapping III, is a collection of Joseph K. Berry's popular *Beyond Mapping* columns published in *GeoWorld* magazine from 1996 through present.



Dr. Joseph K. Berry is the Principal of Berry & Associates // Spatial Information Systems (*BASIS*), consultants and software developers in Geographic Information Systems (GIS) technology. He has written over two hundred papers on the analytic capabilities of GIS and is the author of the popular books *Map Analysis*, *Spatial Reasoning*, *Beyond Mapping*, *Analyzing Precision Ag Data*, *Analyzing Geo-Business Data*, *Analyzing Geo-Spatial Resource Data*, *The Precision Farming Primer* (online) and *Beyond Mapping III (online)*. He serves as the Keck Scholar in Geosciences at the University of Denver and is an Adjunct Faculty member at Colorado State University. He holds a BS degree in Forestry from UC Berkeley and two degrees from CSU—MS in Business Management (1972) and PhD emphasizing Remote Sensing (1976). Website: **http://www.innovativegis.com/basis/**

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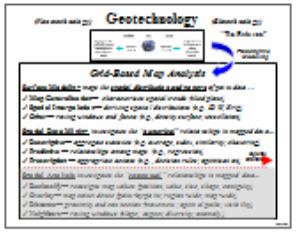

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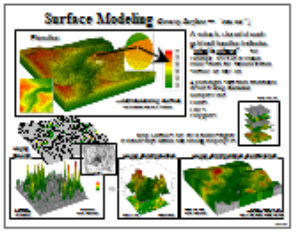

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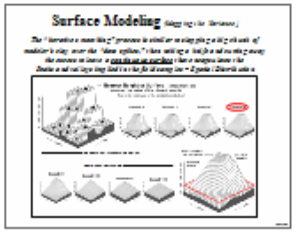

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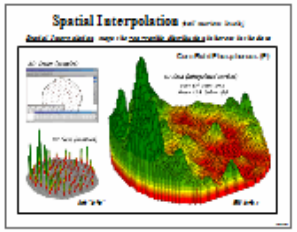

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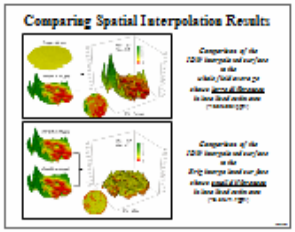

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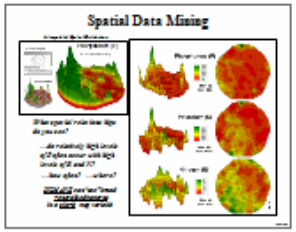

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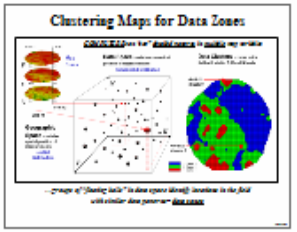

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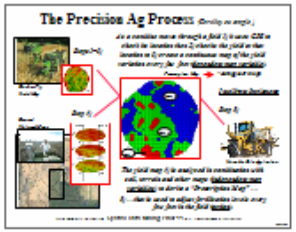

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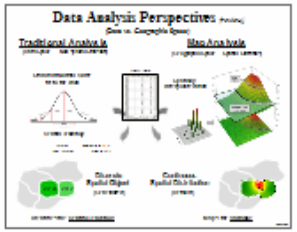

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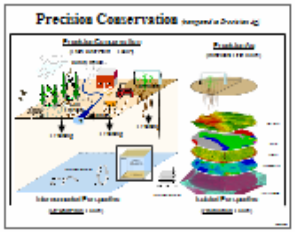

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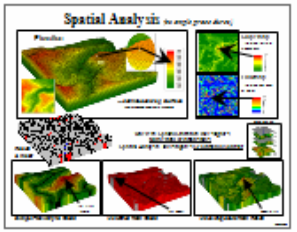

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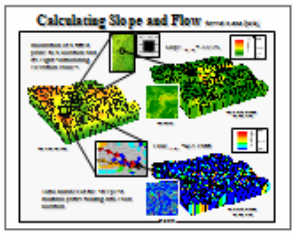

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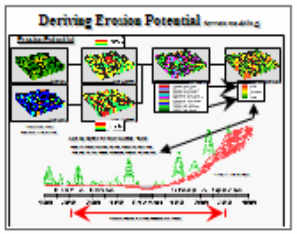

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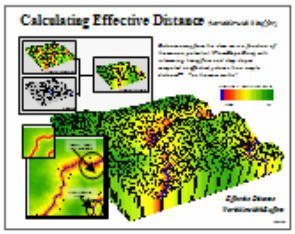

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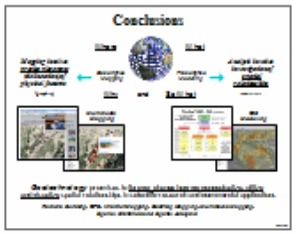

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