



MapCalc examples and support materials are continually updated.

For more information on MapCalc, see [www.innovativegis.com/basis](http://www.innovativegis.com/basis)

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### MapCalc background...

- [White paper](#) describing a conceptual framework for grid-based map analysis
- [MapCalc Legacy](#) a historical look at the software system's roots
- [Instructor Materials](#) 2-CD set of materials (supporting 1 hr. Overview Lecture, 2 hr. Seminar, 8 hr. Workshop, 10 week Course)
- [Example Course](#) all materials supporting an upper-division/graduate course in GIS Modeling

### General Information about MapCalc...

- [General Description](#) of the MapCalc software system for grid-based map analysis
- [Online Review](#) of the MapCalc software system (GeoWorld review)
- Examples of [MapCalc Interface and Display](#) procedures and capabilities
- Listing of [MapCalc Analytical Operations](#) organized into five classes (Reclassify, Overlay, Distance, Neighbors and Statistics)
- [Cross-Reference](#) of MapCalc analysis operations to other grid-based packages (ESRI Grid/Spatial Analyst; ERDAS; GRASS)
- [Short Video Demos](#) viewable online or download
- [MapCalc Tutorials](#) seven tutorial exercise for MapCalc Users

### The following links describe some basic considerations in grid-based map processing and display...

- [Display Type](#) (Lattice or Grid and 2D or 3D)
- [Data Type](#) (Discrete or Continuous)
- [Color Interval/Pallet](#) (Shading Manager)
- [3D Display Options](#) (Plot Cube)
- [Data Inspection and Charting](#) (Map Properties)

*Note: the above processing and display examples use MapCalc **Island.rgs** database*



**Application Examples**— the following links show how grid-based map analysis can be used in various applications...

➔ *Note: All of the following applications can be executed in [MapCalc Learner](#) (see above) for hands-on experience in developing and implementing map analysis models. The MapCalc Learner databases are identified with each application and the text describes the processing. The model logic and processing flow, however, are supported by most grid-based analysis software ...command names, options available and syntax might vary. The MapCalc Learner educational system can be [downloaded for free from www.innovativegis.com](#).*

- **Identifying Campground Suitability:** A recreation specialist needs to generate a map that identifies the relative suitability for locating a campground. In an initial planning session it was determined that the best locations for the campground is on gently sloping terrain, near existing roads, near flowing water, with good views of surface water and oriented toward the west. (Matches Tutorial Lesson 7; uses MapCalc Learner **Tutor25.rgs** database)
- **Determining Proximity:** A wildfire response team needs to determine the relative proximity of all off-road areas to existing roads for estimating response time should a fire occur. (uses MapCalc **Tutor25.rgs** database)
- **Creating an Uphill Road Buffer and Characterizing Slope Within It:** A highway engineer needs to create a map that shows the relative steepness (slope) of the uphill terrain from a road network. This information will be useful in identifying locations susceptible to earth slides. (uses MapCalc **Island.rgs** database)
- **Travel-Time and Customer Access:** A market analyst needs to construct an “underlay” for a client’s MapInfo database that shows the travel-time from Kent’s Emporium to all other locations within a defined service area. This information will be invaluable in visualizing relative access of potential customers throughout the city. ([PowerPoint animation](#) of travel-time surface construction; uses MapCalc **Smallville.rgs** database)
- **Store Competition Analysis:** A local storeowner needs to identify the spatial impact of a new store that is under construction on the other side of town. (uses MapCalc **Smallville.rgs** database)
- **Transferring Data to MapInfo Tables:** A market analyst needs to transfer information on travel-time from a client’s store that was derived in MapCalc to a MapInfo table identifying the residences of customers. This

information will be invaluable in geo-query and statistical summary of customer characteristics within specified zones of proximity. (uses MapCalc **Smallville.rgs** database)

- **Determining Visual Exposure:** A land planner needs to determine areas that are highly visible from the road network for consideration in a new development plan for the county. (uses MapCalc **Tutor25.rgs** database)
- **Modeling Visual Exposure from Roads and Houses:** A natural resource manager needs a map that identifies the relative visual exposure of forested lands in the county. This information is important in deciding where visually sensitive activities should and shouldn't be located. (uses MapCalc **Tutor25.rgs** database)
- **Mapping Wildfire Response:** The on- and off-road response-time throughout a project area is needed for countywide emergency planning and fire risk modeling. The initial response model considers on-road and off-road travel depending on terrain and land cover conditions. (uses MapCalc **Tutor25.rgs** database)
- **Mapping Wildfire Risk:** A fire risk map for the project area is needed for countywide emergency planning. To meet this need an initial Wildfire Risk Model was developed that considers 1) Fuel Loading based on terrain and cover type conditions, 2) Fire Detection based on visibility to housing and roads and 3) Fire Response-time based on relative and absolute barriers to emergency vehicle movement. (uses MapCalc **Tutor25.rgs** database)
- **Mapping Surface Flows and Pooling:** A farmer needs to identify areas in his field that are likely to accumulate materials, such as fine soil particles, organic matter and applied chemicals through surface water flows. The movement of materials to areas of "pooling" can affect crop production. (uses MapCalc **AgData.rgs** database)
- **Visualizing Mapped Data:** A crop consultant needs to generate maps of crop yield that are more effective in conveying yield patterns throughout a field. Most mapping programs simply display 2-D contour maps that are automatically themed into a few discrete color zones. The method used in contouring the continuous yield data collected in the field greatly biases the perceived patterns. (uses MapCalc **AgData.rgs** database)
- **Generating Surface maps from Point Data:** A farmer wants to generate a set of maps from soil samples he has been collecting for several years. Previously, he would simply calculate the average of the sample values for each soil variable, such as amount phosphorous, and develop a fertilization plan assuming the average level was everywhere the same within a field. Creating surface maps of these data enables him to visualize the spatial distribution of data as contour and 3D displays. He also wants to analyze the spatial patterns within the data (e.g., determine where in the field there are unusually high or low amounts) and relationships among the maps (e.g., determine where the greatest increase or decrease in a soil nutrient has occurred over the past several years). (uses MapCalc **AgData.rgs** database)
- **Summarizing Map Regions:** A watershed manager needs to identify the average slope and other terrain statistics for a set of watersheds. This information will be used in concert with other information to estimate surface runoff and erosion potential for the watersheds. (uses MapCalc **Island.rgs** database)
- **Comparing Map Surfaces (Difference):** A farmer wants to compare this year's corn yield with last year's and identify areas in the field with large differences. (uses MapCalc **AgData.rgs** database)
- **Comparing Discrete Maps (Coincidence Summary):** A geographer wants to compare two interpreted maps of the same area and quantitatively report how similar they are. (uses MapCalc **Tutor25.rgs** database)
- **Assessing Localized Variation:** An agricultural scientist wants to locate areas in a field that exhibit highly variable yield patterns. In data analysis and the development of yield models, these areas should be treated differently from areas that have consistent yield levels. (uses MapCalc **AgData.rgs** database)
- **Identifying Areas of Similar Data Patterns (Clustering):** A farmer wants to identify areas in a field that have similar soil nutrient patterns (management zones). Instead of managing the field as one complex unit the intent is to tailor actions, such as fertilization prescriptions, to the conditions in each data cluster. (uses MapCalc **AgData.rgs** database)
- **Assessing Cover Type Diversity:** A riparian ecologist needs to identify the cover type diversity around open water features to help identify critical wildlife habitat. (uses MapCalc **Tutor25.rgs** database)
- **Characterizing Narrowness:** A wildlife biologist needs a map that identifies the relatively narrow portions of each vegetation parcel in a project area. This information will be analyzed with radio-collar data to determine patterns of animal movement with respect to land cover narrowness. (uses MapCalc **Tutor25.rgs** database)
- **Delineating and Summarizing Core Area:** A wildlife biologist needs a map that identifies core area for meadow parcels in a research area and the distance to water for each location in the core area. This information will be analyzed with nesting information about various ground-nesting birds. (uses MapCalc **Tutor25.rgs** database)