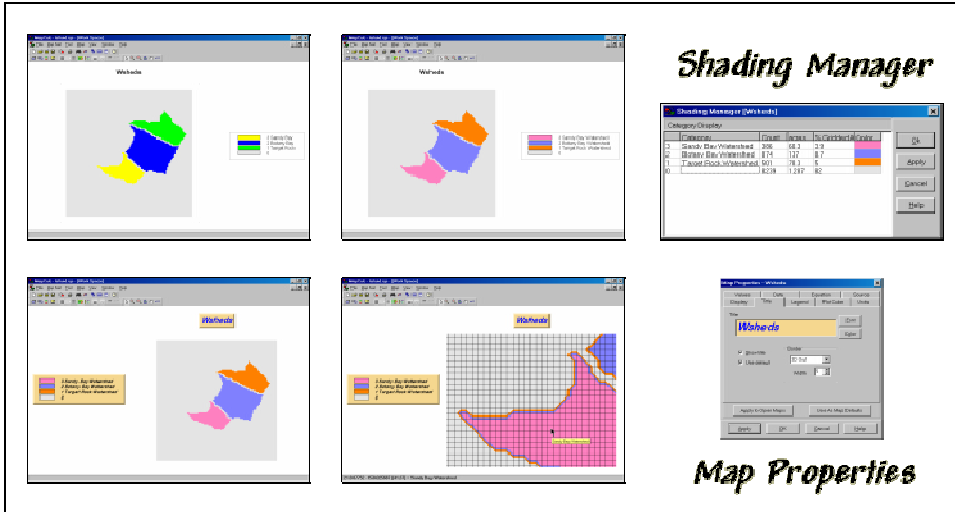# Applying MapCalc Map Analysis Software

Using MapCalc's Shading Manager for Displaying Discrete Maps: *While grid-based systems are best suited for processing and displaying continuous maps, there are several considerations for grid-based display of discrete map data.*

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Summary of MapCalc Shading Results.

Understanding the Difference between Continuous and Discrete Maps. The characteristics of the map values determine whether a map is *Continuous* or *Discrete*.
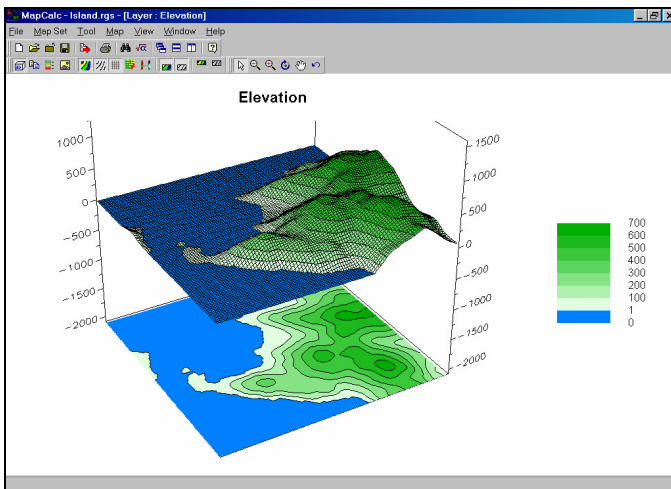

Elevation Surface (Continuous).   All grid-based data (also referred to as "raster" data) is represented as a matrix of numbers. Continuous maps contain values that form a continuum in both numeric and geographical space, such as an elevation map, temperature gradient or sales density surface. The range of values on the map is divided into **contour intervals** and **colors** are assigned to each interval.

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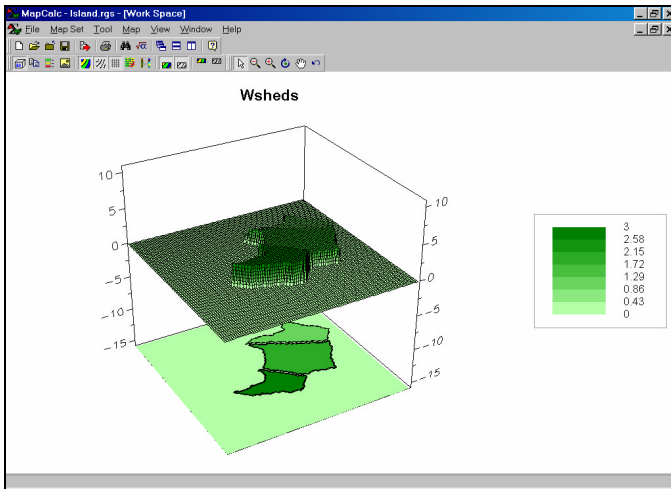
Watershed Map (Continuous).
Discrete map data, on the other hand, does not infer a continuous range of data values. For example, a watershed map might contain only four numbers— 0 for no information and values 1, 2 and 3 assigned to three different watersheds. If these data are displayed as continuous data the software assigns a set of contours and color gradient to the data range— 0 to 1 divided into eight contour intervals as shown in the figure.

Also, continuous data assumes the map values are numerically related and a 3D plot shows the progression from low to high values. In this instance the values do not imply a numerical relationship and it would be silly to show them as a 3D surface.
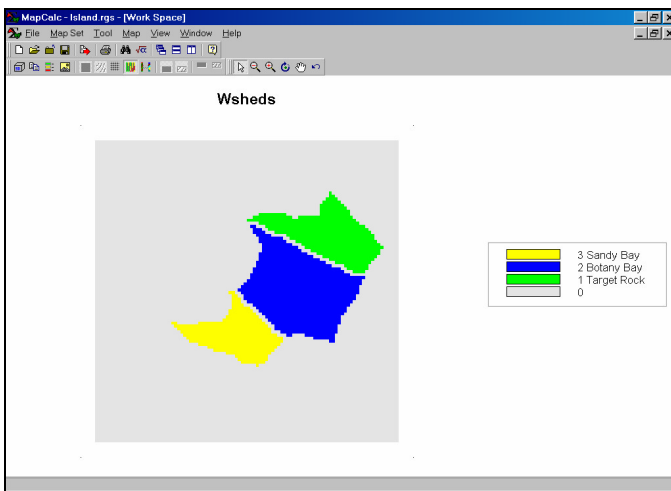
Watershed Map (Discrete). Discrete maps are generally displayed in 2D with category labels (not the map values) providing information about the map features. This display was generated by pressing the ***3D Toggle*** (set to 2D display) and ***Data Type*** (set to discrete data) buttons on MapCalc's tool bar (or from the Main Menu under the Map item).

<u>Assigning Colors, Map Title and Labels.</u> A different color scheme can be applied by right-clicking on the map then selecting the "***Shading Manager***" (or clicking on the "Shading Manager" button on the tool bar; or from the Main Menu, select Mapà Shading Manager)…

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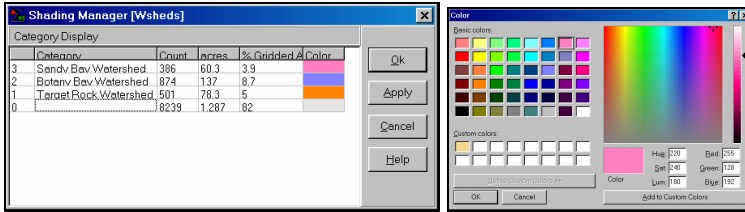
Shading Manager Box (Discrete Data) and Pop-Up Color Pallet. The color for a discrete map category can be changed by selecting it, then choosing a new color from a pop-up pallet. In this example a pink shade was assigned to Watershed number 3, Sandy Bay.

Category labels can be changed simply by clicking on the text and modifying them. In this example the word "watershed" was added to each of the labels.
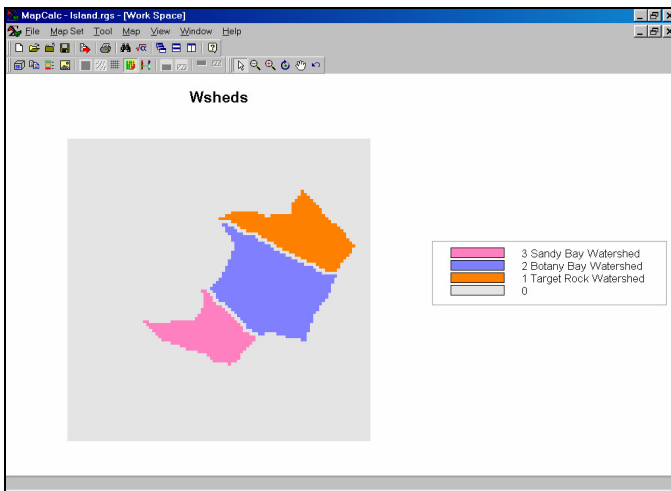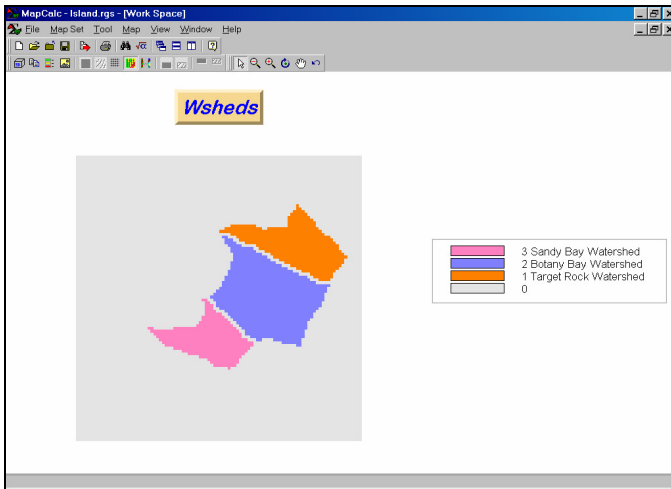

Watershed Map (changed colors).

Changing Map Properties for Display . The map's Title and Legend formats can be changed by right-clicking on the map then selecting "***Properties***" (or from the Main Menu, select Mapà Properties)…
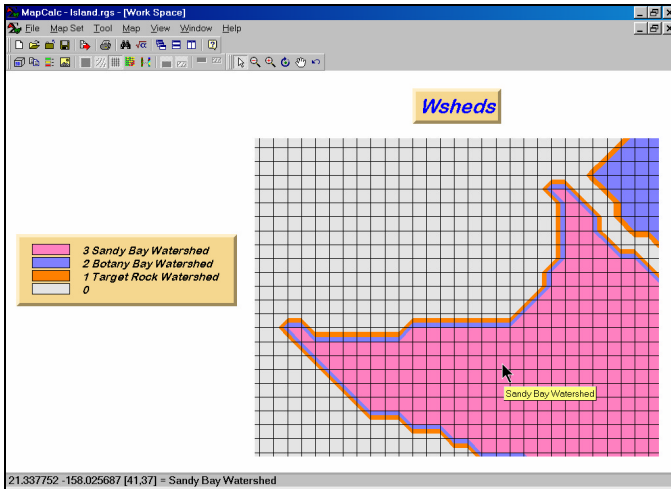

Map Properties Box (Title tab). The ***Title*** tab in the properties box allows you to customize the appearance of the title in the display. In this example, a blue italicized Aerial font at 18-pitch was specified (Font and Color buttons). A "3D Out" border was selected.

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Watershed Map (changed title).

<u>Changing Between Grid and Vector Display Types.</u> All

***Watershed Map (changed legend,
display type and zoomed to a portion of the map area).***

<u>Changing Between Grid and Vector Display Types.</u> If you attempt to display a continuous map as a discrete map a warning message of "*This map has too many discrete values. Do you want to continue?*"   If you respond yes, the map will be displayed as discrete but the legend will contain a large number of unique colors—one for every value on a map…
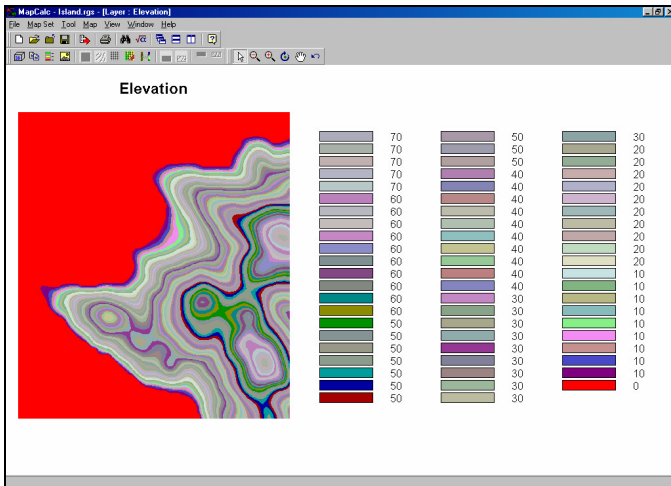
Elevation Surface Displayed as Discrete Map. Actually there are hundreds of separate numbers and, although MapCalc tried to display as a discrete map, its default pallet is limited to just 64 colors. Generally speaking, it is inappropriate to display continuous maps as discrete and discrete maps as continuous— they are different data types.

Summary. The map values comprising ***Discrete*** maps do not form a continuous gradient and therefore contour interval assignment is inappropriate. By switching from *continuous* to *discrete* data type (***Data Type*** button on MapCalc's tool bar) a unique color is assigned to each individual map value.

When attempting to view a map, you should first consider its ***Data Type*** (*Discrete* or *Continuous*) then decide on the ***Display Type*** (*Lattice* or *Grid* and *2D* or *3D*) and finally the ***Color Intervals/Pallet*** (*Shading Manager*) to use.