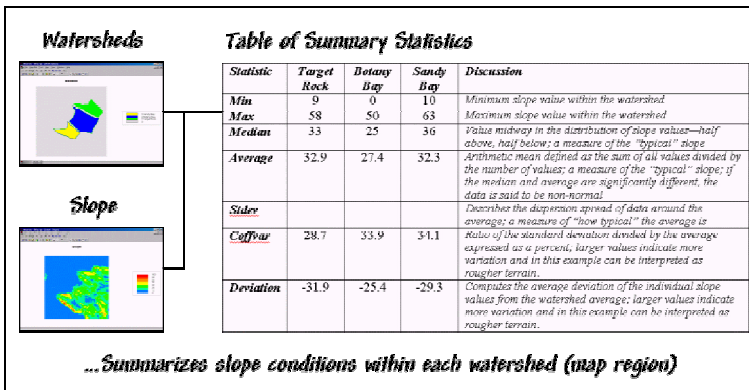


Applying MapCalc Map Analysis Software

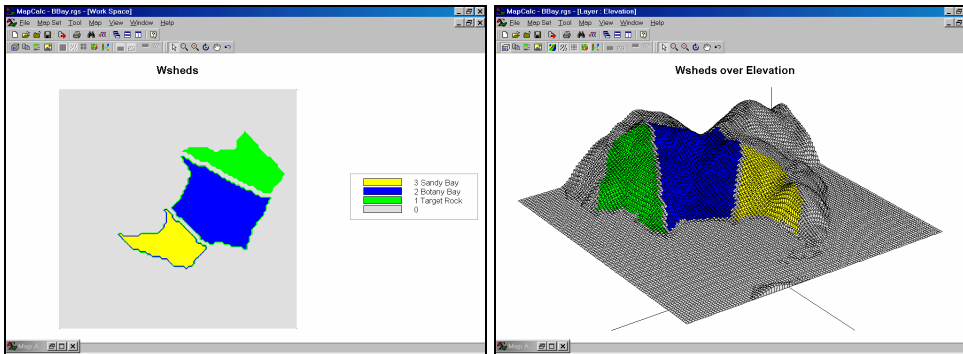
Summarizing Map Regions: A watershed manager needs to identify the average slope and other terrain statistics for a set of watersheds. This information will be used in concert with other information to estimate surface runoff and erosion potential for the watersheds.

[click here](#) for a printer friendly version (.pdf)

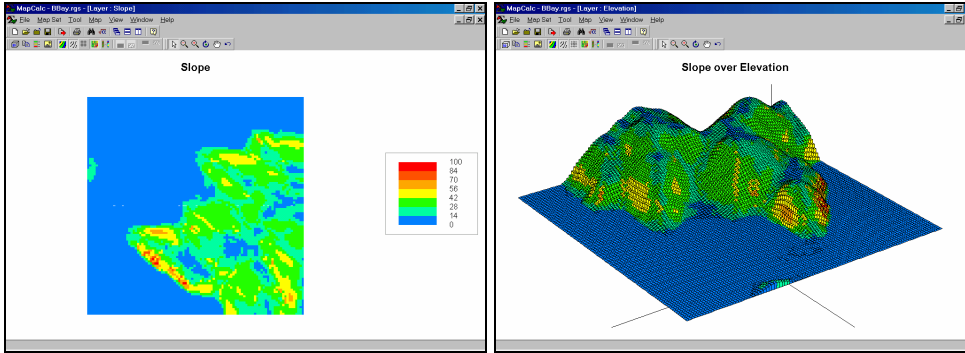
Processing Flow.



Base Maps. The Base Maps needed include:

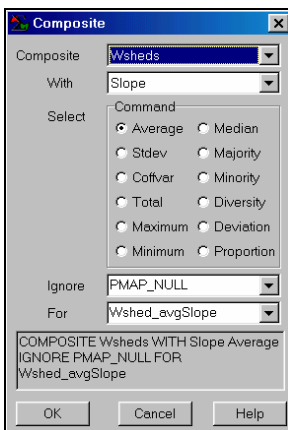


Watersheds Map. The target Rock, Botany Bay and Sandy Bay watersheds are shown. The ridges and coastline bordering the watersheds have been excluded to define just the interior portions.



Slope Map. The slope map for the elevation surface was calculated and stored as a base map in the Island database. The Slope operation *SLOPE Elevation Fitted FOR Slope* was used.

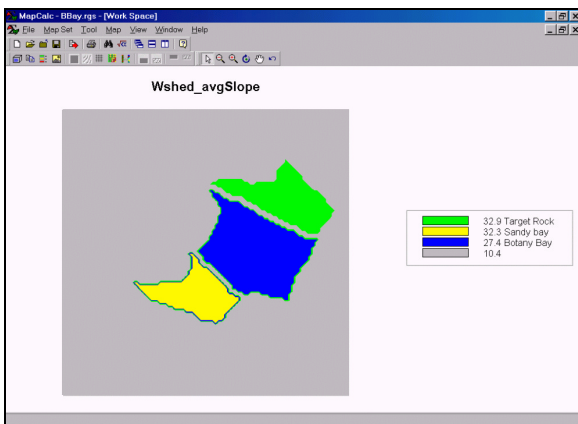
Step 1. The MapCalc operation...



COMPOSITE Wsheds WITH Slope Average FOR

Wshed_avgSlope.

...generates a map that identifies the average slope for each watershed (termed a “region”).



Wshed_avgSlope Map. Overall, the Botany Bay watershed (27.4) is slightly less steep than the Sandy Bay (32.3) and Target Rock (32.9) watersheds.

By simply changing in the *Composite* command's summary method (radial buttons in the above Composite dialog box) other terrain statistics can be generated...

<i>Statistic</i>	<i>Target Rock</i>	<i>Botany Bay</i>	<i>Sandy Bay</i>	<i>Discussion</i>
<i>Min</i>	9	0	10	<i>Minimum slope value within the watershed</i>
<i>Max</i>	58	50	63	<i>Maximum slope value within the watershed</i>
<i>Median</i>	33	25	36	<i>Value midway in the distribution of slope values—half above, half below; a measure of the “typical” slope</i>
<i>Average</i>	32.9	27.4	32.3	<i>Arithmetic mean defined as the sum of all values divided by the number of values; a measure of the “typical” slope; if the median and average are significantly different, the data is said to be non-normal</i>
<i>Stdev</i>				<i>Describes the dispersion spread of data around the average; a measure of “how typical” the average is</i>
<i>Coffvar</i>	28.7	33.9	34.1	<i>Ratio of the standard deviation divided by the average expressed as a percent; larger values indicate more variation and in this example can be interpreted as rougher terrain.</i>
<i>Deviation</i>	-31.9	-25.4	-29.3	<i>Computes the average deviation of the individual slope values from the watershed average; larger values indicate more variation and in this example can be interpreted as rougher terrain.</i>

Region-Wide Statistics Table. The region-wide statistics suggest that the Target Rock watershed is slightly steeper (Average= 32.9) and not as rough (Coffvar= 28.7) as the other two watersheds.

Summary. Region-wide summary uses one map (termed the “template” map) to identify locations whose corresponding values on another map (termed the “data” map) will be summarized. In this example, slope values (data map) within three watersheds (template map) were summarized. A forest manager could use the same technique to summarize the average slope of individual forest parcels—the steeper ones being more expensive to harvest. Combine average slope information with average distance to existing roads and average visual exposure to roads and houses and the manager has even more information for decision-making. Change the nature of the input data and the process can be extended to a host of other disciplines—land use planners, market analysts, environmental scientists, etc.