Input > Landscape Utilities > Landscape Calculator

The landscape calculator allows you to perform mathematical or logical operations on the data in the themes of your landscape file. This is often useful when you need to modify data in the Landscape (.LCP) File but don't have a GIS (or want to use one). The landscape calculator is intended to provide some support for the spatial data you use in your simulations, but it is not intended to duplicate or replace the capabilities of a GIS (which are more flexible and powerful than this feature).

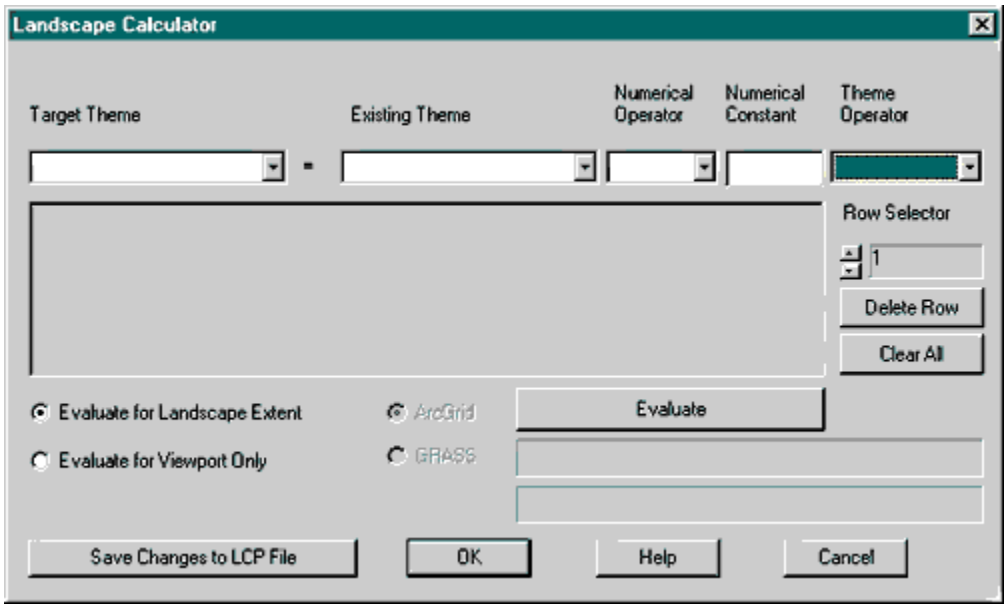
With the Landscape Calculator, you can:

- modify themes directly in the Landscape (.LCP) File, and
- create separate raster files in ASCII grid format.

There are no parentheses in the Landscape Calculator. Thus, for complex expressions requiring parentheses to establish priority, you will have to make intermediate ASCII files and use these in additional expressions.

Using the Landscape Calculator

1. First, you must have a Landscape (.LCP) File loaded and visible, either by loading a Project (.FPJ) File and initiating a simulation (Simulate > Initiate/Terminate) or by viewing an Landscape (.LCP) File (View > View Landscape File). Then you can open the Landscape Calculator with the Input > Landscape Utilities > Landscape Calculator command.



2. Select the Target Theme using the dropdown list. The target theme is the theme or layer in which you want to store the results of the landscape calculation. By selecting

an existing theme in your Landscape (.LCP) File, any calculations will directly change that theme in memory. You can also select New ASCII File from the drop down list which will put the results of your calculations into a new ASCII grid or GRASS format file (you select the filename and the format).

3. The calculation is specified using these four text boxes:

- Existing Themes - These are themes already in your Landscape (.LCP) File or raster themes that are currently being viewed (View > View Raster File) and have their legend visible in the "Simulation Legend".
- Numerical Operators - These are mathematical and logical operators (to add, subtract, compare, transform etc) the numbers in the existing theme.
- Numerical Constants - These are numbers that are used according the numerical operator involving the data in the existing theme.
- Theme Operators - These are operators among themes, essentially treating the theme as an element in the expression.

For example, lets say you want to modify Crown Base Height in your Landscape (.LCP) File. We want to subtract 1.0 meter from the existing value everywhere our current Crown Base Height is greater than or equal to 3 meters. This expression would be written as (using CBH for Crown Base Height):

CBH=CBH-1 IF CBH>=3.

To accomplish this we must use two "rows" of expressions to explain the calculation. Select the following items in the order listed below and you will see the expression written in the large text box in the middle of the Landscape Calculator:

Order	Argument	User Selection
1	Target Theme	Crown Base Height
2	Existing Theme	Crown Base Height
3	Numerical Operator	- (minus sign)
4	Numerical Constant	1.0
5	Theme Operator	IF
6	Existing Theme	Crown Base Height
7	Numerical Operator	>=
8	Numerical Constant	3
9	Theme Operator	#END#

You must input an #END# for the Theme Operator at the end of your expression.

4. Now, you must decide if you want this calculation to be evaluated for the spatial domain of the entire Landscape (.LCP) File or just the current Viewport (see View > Change Viewport). Make sure the buttons in the lower left correctly indicate your intended spatial domain. Note that the spatial resolution (e.g. cellsize) of all calculations is determined by the Landscape (.LCP) File resolution.
5. Last, click the Evaluate button to have the expression evaluated for all cells in the domain (whole Landscape (.LCP) File or just the Viewport). The calculations are

made in memory and not written to the existing Landscape (.LCP) File on your hard drive until you click the Save Changes To LCP File button. Regardless, any subsequent calculations you make will still include the changes you have just made by evaluating the expression (e.g. your crown base heights have been changed for further simulations and calculations even if you don't save to disk). If you decide you want to discard the changes you made you must reload the Landscape (.LCP) File.

At any time you can modify the expression by using the Row Selector spin box to identify a specific row and then changing your inputs for that row. You can also clear all of your selections with the Clear All button.

NOTE: you must know the data units in your Landscape (.LCP) File before using the Landscape Calculator. If you are uncertain, then you can either check them with the Input > Landscape Utilities > File Information feature or choose to create a new ASCII output file with the Landscape Calculator rather than choosing an existing theme as your target theme. Then, you can replace the existing theme (i.e. crown base height) in the Landscape (.LCP) File after you've verified that the data are correct.