Set Raster Null Cells

Raster objects in TNTgis can have *null cells*, the term used to indicate that the specified cells do not represent valid data and should be ignored during display or processing. Null cells can be identified in one of two ways:

• a single *null value*: all cells with the designated value are treated as null;

• a *null mask*: a binary raster subobject that has value 0 for null cells and value 1 for valid (non-null) cells.

Null masks are a more flexible means of indicating null cells because they can indicate null areas having more than one cell value or including only a subset of cells with a specific value.

The Set Raster Null Cells process (Image / Utilities / Set Null Cells) lets you set or remove null cell assignments for one or more input rasters using numeric criteria. You can set a single value as null, set values outside a specified range as null, change all current null cells to a specified value, or change existing null cells to valid (non-null). Raster histograms and pyramid tiers are automatically rebuilt by the process. If you need to set null cells by area (*e.g.*, set marginal 0 areas to null while preserving interior 0-valued cells as valid), you can use the interactive Mask Editor (Image / Utilities / Edit Mask); see the Technical Guide entitled *Create and Edit Null Masks and Mask Rasters*.
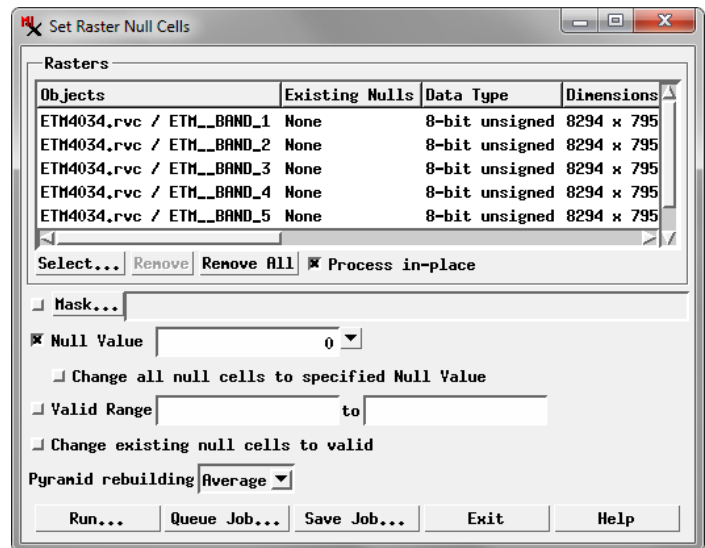
Rasters Controls

Press the Select pushbutton in the Rasters box to choose one or more raster objects to process. All selected raster objects must have the same cell data type (*e.g.*, all 8-bit unsigned integer, or all 24-bit color-composite). The selected rasters are then shown in the Objects list. This columnar list shows the file and object name in the Objects column, and information about current null settings in the Existing Nulls column. This column shows the numeric null value if a single null value is set, "Mask" if the input raster has a null mask, or "None" if there are no null settings. Additional columns in the list show the raster data type, dimensions, cell size, range of cell values, extents ranges, and coordinate reference system.

You can remove objects from the list in two ways: select one or more input rasters in the list and press the Remove pushbutton, or press the Remove All button to clear the list. Left-click on a list entry to select it exclusively, <Ctrl> left-click to toggle selection, or <Shift> left-click to select more than one entry (or a range of entries).

Process in-place

If you turn on the *Process in-place* toggle button, the specified null settings are applied directly to the input raster or rasters. If this toggle is not turned on, you are prompted to select an output raster object for each input to receive the null settings, and the inputs are left unaltered.

Designate null cells by specific cell value or as cells outside a valid range of values.

Null Value Controls

Turn on the Null Value toggle to set a specified cell value as null. For single-valued data types (integer and floating point), a single numeric field is provided in which you can enter a numeric value, or you can use the menu button to the right of the field to choose Minimum, Maximum, or Zero. For 24-bit color-composite raster objects, three fields and accompanying menu buttons are provided to set the null value for the three components. If you choose Minimum or Maximum from the menu button, the actual numeric value appropriate for the input raster data type is shown in the field.

When you choose the Null Value option, the *Change all null cells to specified Null Value* toggle is also active (unless the input raster is has JPEG2000 or lossy compression or is a link to an external file). This option changes the raster values of all cells considered to be null to the specified output null value (even if the cells are set to null in the output by a null mask).

Valid Range

You can designate a range of cell values as *valid* and set all cells with values outside that range as null. To apply a valid range, turn on the Valid Range toggle button and enter the minimum and maximum values in the desired range in the numeric fields to the right of the toggle label.

For typical raster data you would use either the Null Value setting or the Valid Range settings. However, in special cases you can use these settings together. For example, you could use the Null Value controls to set a specific value inside the Valid Range as null.

Null Mask or Null Value

The process sets a null value (rather than creating a null mask) under the following conditions:

- the input raster does not have a null mask;
- the result of your settings is a single numeric null value;
- you choose to *Process in-place*;
- the raster does not have lossy compression, does not have JPEG2000 compression, and is not a link to an external file.

In all other cases in which null cells are specified, a null mask is created as the result.

Change Existing Null Cells to Valid

You can turn on the *Change existing null cells to valid* toggle to remove existing null designations for the inputs. If an input raster has a null mask, this action may result in cells with more than one value being marked as valid, so this option should be used with caution. You can also use this option in combination with the Valid Range and Null Value options to remove existing null settings and impose new settings.

Pyramid Rebuilding

The *Pyramid rebuilding* menu provides standard options for computing reduced-resolution pyramid tiers for fast display of large raster objects. The Average option provides the best result for images and other continuous-value raster objects. The Sample option is most appropriate for categorical raster objects (such as class rasters) in which the cell values have no actual numeric significance. The option None should only be used for very small raster objects.

Running the Process

Press the Run button to run the process immediately. Queue Job and Save Job buttons are also provided to allow you to run the process using the TNTmips Job Processing System. See the Technical Guide entitled *TNTmips Job Processing System* for more information.