

## Vertical Mapper 3.1.1 Release Notes

### Requirements

Vertical Mapper 3.1.1 requires a copy of Vertical Mapper 3.0 or 3.1 on the machine in order for the patch to run successfully.

Vertical mapper 3.1.1 has been tested for compatibility with MapInfo Professional 8.0.

### System Requirements

Pentium II processor or higher (recommended)

128 MB of RAM (recommended)

47 MB of free hard disk space (includes 30MB for the tutorial files)

SVGA or higher resolution monitor; high color (16 bit) (recommended)

Windows 98 SE

Windows 2000 SP 3

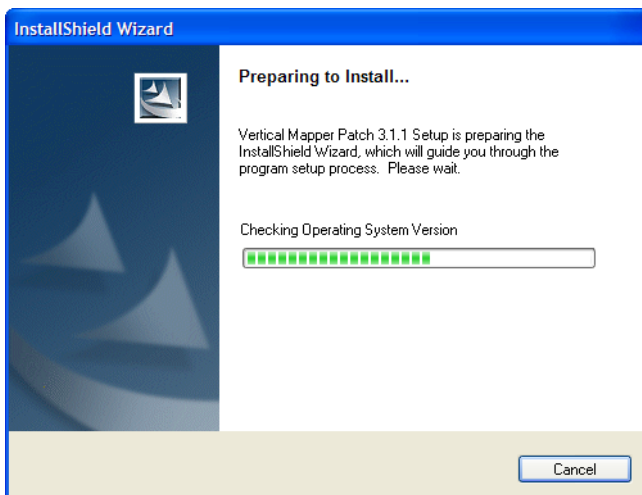
Windows NT 4.0 Workstation SP 6a

Windows XP Professional SP1

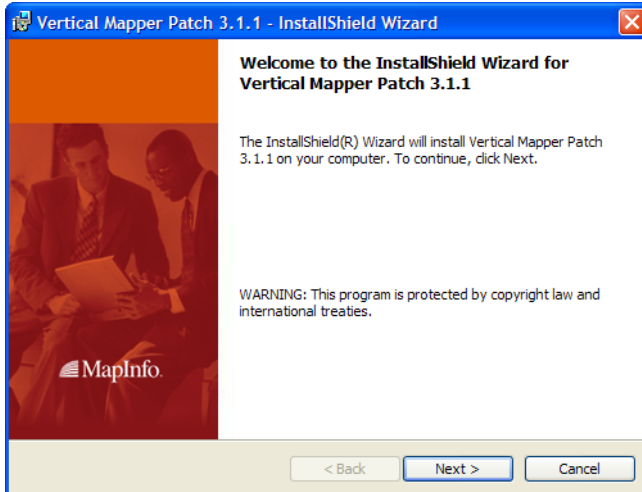
### Installing the Vertical Mapper 3.1.1. Patch

You must have Vertical Mapper 3.0 or 3.1 installed prior to running the Vertical Mapper 3.1.1 patch installer. If you have modified your installation of Vertical Mapper 3.0 or 3.1 in a manner which involved deletion of installed files, you must re-run the 3.0 or 3.1 installer prior to installing this patch.

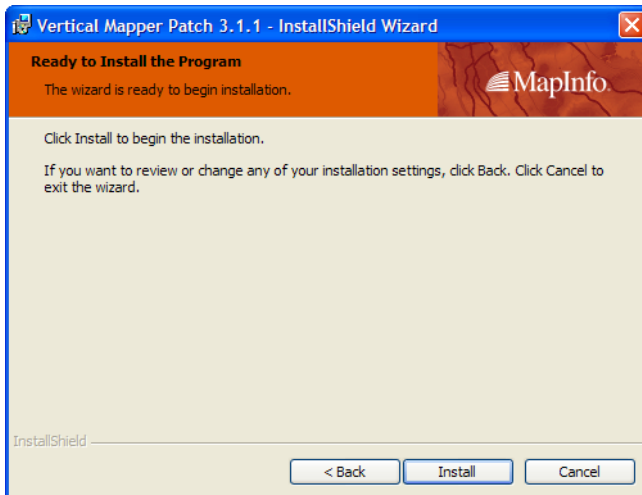
1. Close any running MapInfo Professional and Vertical Mapper applications.
2. Run setup.exe from the product CD or from your web download location to start the installer. The *Preparing to Install* dialog box displays.



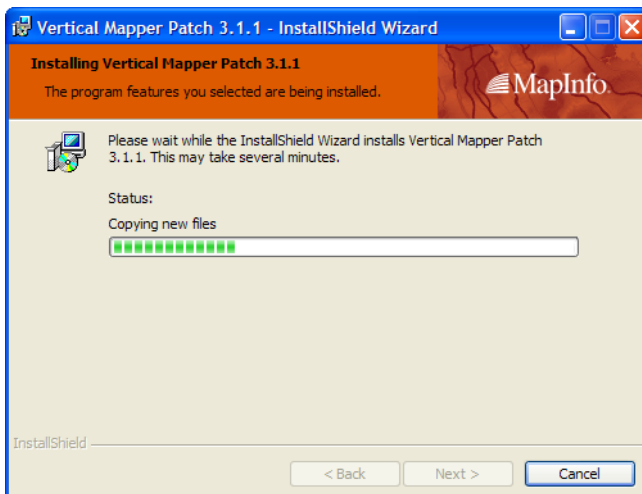
Once the InstallShield Wizard has been prepared, the *Welcome to the InstallShield Wizard for Vertical Mapper Patch 3.1.1* dialog box displays.



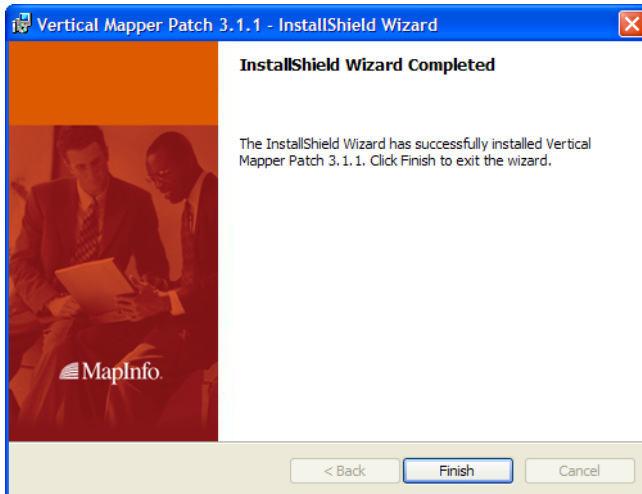
3. Click **NEXT**. The *Ready to Install the Program* dialog box displays.



4. Click **INSTALL**. The *Installing Vertical Mapper Patch 3.1.1* dialog box displays. At this time, all required patch files are installed onto your computer.



Once all files are installed, the *InstallShield Wizard Completed* dialog box displays.



5. Click **FINISH** to exit the installer.

## New Grid Smoother Utility

The Vertical Mapper 3.1.1 Patch contains a new Smoother feature that reduces the variability in a numeric grid by averaging cell values contained in a specific area. In general there are two categories of filters. The first category includes low pass (averaging) filters used for smoothing the variation of cell values found in a grid. The second category consist of edge detection or high pass filters, these are typically used for enhancing edges in grids and images. The new Vertical Mapper Smoothing feature uses the first category of these filters.

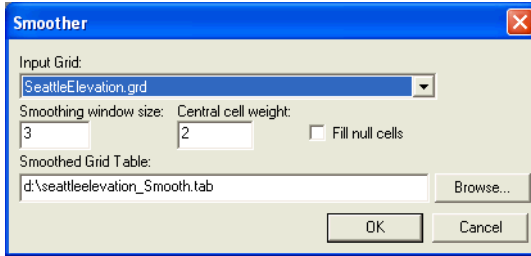
### What is Smoothing?

Smoothing is the act of filtering a grid by modifying the values of every cell in a numeric grid to be the average of it's neighboring cells. This averages out the data in the grid to provide a more high-level or relative representation of the data, thus removing any 'noise' from contours created from grid data and reducing the size of those contour files.

The basic principal of averaging filters is to pass a window (3x3 or 5x5 cells) through the grid, calculating the average value of all pixels inside the window and assigning this value to the central cell in the window. The size of the window has an impact on the results; a greater degree of smoothing will result when using a larger window size.

### Using the Smoother Utility

The Smoother utility only works on numeric grid data. With at least one numeric grid file open, click **Smoother** from the **VERTICAL MAPPER** menu within MapInfo Professional. The *Smoother* dialog box displays.



Use the **INPUT GRID** drop-down list to choose a grid file to smooth from a list of all opened numeric grids.

A default output table file name will be provided in the **SMOOTHED GRID TABLE** field based on the name of the selected input grid (“\_Smooth” suffix is added). You may change this default file name or click **BROWSE** to select an existing TAB file to overwrite with the new smoothed data. You may want to use the default settings until you are comfortable with the way this utility works.

Use the **SMOOTHING WINDOW SIZE** field to control the level of smoothness of the grid. This setting tells the Smoother how big a matrix to look at when computing a grid cell's average neighboring cell value. The default value is 3, which means a matrix of 3 by 3 cells. This smoothing window size number must be an odd number and range from 3 to 21 (for example, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 21). The ‘smoothness’ of your contour will depend on how large a value you use; a value of 21 will compute the average of a 21 by 21 matrix, thus yielding a smoother contour due to more grid data used in the average computation for each grid cell. A value of 3 will compute the average of a 3 by 3 matrix, thus yielding a rougher contour due to less grid data used in the average computation for each grid cell.

Use the **CENTRAL CELL WEIGHT** field to set the weight of the central cell's value when computing the new averaged cell value. This gives the middle of the contour segment more weight in determining the new path of the smoothed contour segment being defined by the grid.

For example, in the 3 by 3 matrix below,

```
1 2 1
4 5 3
7 0 9
```

if the central ‘5’ cell's weight is set as 1, then the new central cell value is calculated as:

$$\frac{1 + 2 + 1 + 4 + (5 \cdot 1) + 3 + 7 + 0 + 9}{8 + 1}$$

where the value 8 in the denominator is the number of cells other than the central cell, and the value 1 both being added to the denominator and being multiplied by the central cell value in the numerator is the central cell weight.

In order to give the central cell value a greater weight, you can enter a weight larger than 1. For example, if you change the central cell weight in the matrix above to 6, the new computed value for that cell is:

$$\frac{1 + 2 + 1 + 4 + (5 \cdot 6) + 3 + 7 + 0 + 9}{8 + 6}$$

Check the **FILL NULL CELLS** check box to have the Smoother compute the average for grid cells that contain no data. You can clear this check box to ignore cells that do not contain data (though this may retain some 'noise' in your output contour data).

Consider the example above with the exception of a null central cell value ('V', meaning 'void' or 'no data'):

$$\frac{1 + 2 + 1 + 4 + (V \cdot 6) + 3 + 7 + 0 + 9}{8 + 6}$$

If you choose to fill null cells, then the central cell (V) will have a new value in the output grid. If you choose not to fill null cells, then the central cell will remain empty (null) in the output grid.

**Note:** The Smoother can significantly reduce the time it takes to complete the contouring process. Use a small matrix size (3x3 or 5x5) and check the **FILL NULL CELLS** check box prior to contouring your data.

## Bug Fixes

**Issue T13933:** Creating contours from a grid file result in a tab file with self intersections and overlaps.

We have implemented the new Smoother utility to resolve this and like issues. Use the new Smoother utility to smooth input grid data to allow contouring to run faster on complex, sparse, or coarse grid cell arrangements.

**Issue T15103:** Extended Error Value: 2636 Encountered when entering specific values into Contouring dialog.

We have updated the vmContour.dll to handle better memory allocation and better handle the size of allocated arrays.

## Vertical Mapper 3.1 Notes

### Features Introduced in Vertical Mapper 3.1

Added a 'Trim Null Boundary on grid create' preference to the Preferences dialog.

When using Reclass tool on a GRC file, user now has two separate dialogs (to Numeric (.grd) & to Classified (.grc)).

Reclass Classified grids (.grc) to Numeric(\*.grd) has entirely new interface.

Region Info Tool on Vertical Mapper tool bar can be used with Classified (\*.grc) grids now.

Grid Import can also be accessed from the Grid Manager > Tools menu.

Grid Manager - Classified Grid (\*.grc) Histograms can be exported to \*.txt files using a right-click > Export from Histogram window.

### Bugs Fixed in Vertical Mapper 3.1

Transparent region background on last contour interval object is now correctly filled as transparent.

Vertical Mapper now supports the use of European number settings.

Cross section tool no longer produces error if line starts or goes off grid.

Grid Color tool: Profiles are now saved correctly.

Creating viewshed with too many points now throws a “The elevation of the observation point is invalid.” message instead of unhandled exceptions.

The Neg() function in grid calculator now returns correct results.

3-D Grid view now produces an error instead of a fatal exception if the file is not a supported grid file.

Grid Buffer: Throws correct error message when passed a table with only a single point.

Grid Manager: 'Copy Grid As' now works properly and opens the copied grid file in Vertical Mapper.

vmRegionContour() function & Contour tool now correctly creates transparent backgrounds for all regions.

When entering an invalid number for Bitmap size value in GridView Scene properties, Vertical Mapper will produce an error and allow a change in the values.

Edit boxes in Grid View Scene Properties dialog now pause before resetting cursor so not to cause reverse ordering of entered information.

GridView now reacts properly without error when any file other than Numeric \*grid is opened via File > Open.

Interpolation: Corrected List Index out of bounds (-1) error when opening table from 'Select Table and Column' dialog inside Interpolation > Natural neighbor.

Selecting GRC in Grid Mgr, but using GRD file in Create Slope & Aspect now runs without unhandled exception.

Corrected behavior when using 0 for viewing radius or Looking From in Viewshed tool.

Corrected access violation error in vmgridman.dll when using Point to Point and a GRC file has been opened.

Point to Point Visibility dialog now allows any grid to be used after the dialog is closed.

Exponents used as variables in Grid Calculator now allow 8 places past decimal point.

The following functions in the Grid Calculator now return correct results: Log10(), Abs(), Ln(), TAN(), ArcTan(), Sqrt(), Power(), Sin(), Cos(), ArcCos(), ArcSin(), and Sqr().

Grid Tools: Graph Customization: Z Units combo box under Y-Axes tab is now enabled when z-units are linear.

Grid Tools: Reclass tool: Saved profiles for Classified grids are now correct.

Grid Tools: Reclass tool: Reclassifying Numeric Grid to New Numeric grid now allows user to alter cell colors.

Create Slope & Aspect: Results now applied to correct grid when different grid highlighted in Grid Manager tool.

Grid Color tool: Profiles are now saved correctly and listed in the combo box after saving.

Point Aggregation using Stats: Aggregation on Lon/Lat table throws warning message instead of an exception when the aggregation distance is greater than 10% of major axis. Aggregation may still fail at that level of complexity, however.

Predictive Analysis: Tool crashes when no vector tables are open for use as teaching tables.

Predictive Analysis: Now handles error when sample data with different projections. Now throws error 937 which means unequal coordsys detected when trying to use a different coordinate system.

Modelling: when using an incorrect projection Vertical Mapper now throws the following message: 'Error Calculating distance conversion. Check Projection'

Now you can set more than 5 Inflection Points in the Vertical Mapper SDK.

Using a selection as a table in Point Density Square Area no longer causes a floating point error.

Mapinfow.exe DDE Server application no longer errors.

## Vertical Mapper 3.0 Notes

### Features Introduced in Vertical Mapper 3.0

Data Analysis, a collection of routines for analyzing both point and grid data. Semi-Variogram analysis has also been made available here as well. The new features include Grid Correlation, Principal Component Analysis and Predictive Analysis.

Point Density: two methods to derive point density, either by square area or kernel smoothing (which indicates the probability of an event recurring in an area)

Custom Point Estimation: Users can specify the calculation to be executed on a set of points within a specified radius. The user may select from the following types of calculations: Sum of Values, Minimum Value, Maximum Value, Average Value, and Count of Data Points.

GRC Reclass: GRC Reclass allows users to modify the class structure of a classified grid, such as changing class names or merging classes with similar characteristics.

Line Info / Line Inspection will provide information about grid cells under a line.

Polygon Overlay: perform overlap analysis on two region tables. This process uses grid technology rather than the vector routines provided by MapInfo.

### Module Updates in Vertical Mapper 3.0

Export to USGS DEM: Produces a DEM file.

The grid color tool has been updated to provide a list of commonly used profiles which the user can add to.

The SDTS translator has been updated to accept the new SDTS format.

The GRC Filter code has been updated to increase the processing speed.

The Coordinate System name recognition has been updated so projections with a custom datum of 9999 properly recognize the coordinate system name in the .PRJ file.

Updated TIN generator to have a closer tolerance of the maximum triangle side length parameter. This affects TIN interpolation, NN Interpolation and Voronoi generation. (Some triangles that slightly exceeded the maximum length were allowed to pass in certain circumstances.)