

SiteView 1.0 Release Notes

These Notes contain items of interest about the SiteView 1.0 release that are not contained in the product User's Guide, or which came to our attention after the Guide was done. We have also included some simple tips on getting the most out of environmental visualization, and on how to increase interactive graphics performance on your PC by paying attention to how you do your work. If you have other tips or suggestions that would be of use to SiteView users, please let us know at 1-617-674-2199.

User tips

This section contains a few tips for using environmental visualization and SiteView that we have acquired from our own experience and from that of early users.

The very first tip is simple: SiteView 1.0 is a new product. Save to backup often to avoid lost data in the event of a system malfunction.

Deleting defining objects or attached objects

When you create derived objects in SiteView, such as surfaces, iso-shells, or stratigraphic sections, these derived objects depend on the set of defining objects that were used to construct them. For example, surfaces and potatoes depend on the measurements or value points that were interpolated to form the derived objects. Stratigraphic sections depend on the borings (vertices) that were chosen to make up their panels. Deleting the defining objects of a derived object without first deleting the derived object itself may cause SiteView to cease functioning. **ALWAYS DELETE A DERIVED OBJECT BEFORE DELETING ITS DEFINING OBJECTS.** In later versions of SiteView you are not able to delete defining objects first, and an instructive message appears if you attempt to do so.

In the same way, do not delete the borings between which stratigraphic polygons have been generated without first deleting the stratigraphic polygons. Otherwise the polygons will be orphaned and SiteView will not know how to management them, and the system may malfunction.

Performance (speed)

The good news about environmental visualization on Windows is that it is cost-effective and easy to use. The trade-off is that PC's and MS Windows are not as fast as big-ticket graphics workstations. Steven Spielberg didn't use PC's to make Jurassic Park, but then he's not in the environmental business. So, here are some tips for increasing the graphics performance of your PC running SiteView.

Quick mode

First, much of what you may want to do does not require full-blown lighting, shading, and rendering of the image you are working with. Unless you want a fully rendered picture, put SiteView in "Quick" mode by clicking on the Quick box at the upper right hand side of the screen. This tells SiteView to outline rather than fill-in such things as surfaces, potatoes, and stratigraphy polygons, and significantly increases the speed of redrawing screens. You can still see where a surface or plume is in space by turning on "cells-visible" in the Properties... window.

Grid size, max grid dimension, and contour interval

Second, when you are smoothing a surface or creating a potato, try to keep the grid only as large as you need to get the job done. The larger the grid points, especially with potatoes in 3D, the more number crunching SiteView must do when interpolating. You don't need great refinement to understand your data or to compose a visualization for a report or presentation. For the final product, you can increase the number of grid points to get an even prettier picture, and then let SiteView run for a few minutes to calculate. This gives you both reasonable performance and a great visualization to show others.

The number of grid points that SiteView uses can be set using either "grid spacing" or "max grid dimension." Grid spacing is the interval between grid points. Making grid spacing larger, reduces the number of grid points. Max grid dimension sets the number of grid points in the largest principal direction of a grid. Making max grid spacing larger, increases the number of grid points.

A similar warning applies to selecting the contour interval. A small contour interval (the increment in value which separates adjacent

contours) forces SiteView to significantly increase the number of calculations it must make in creating a surface.

Hardware

If all else fails--and you believe that quick graphics performance might be worth a little extra money--there are some hardware solutions to increased performance.

The first of these is more memory (RAM). SiteView runs in 16MB for normal sized sites. More memory makes SiteView run faster, especially if you have large, complex visualizations (e.g., fine-grained potatoes and surfaces, big windows, or many potatoes).

The second of these is to buy a 90 MHz Pentium™-based PC. We have had calls from users who have Pentiums, and they say that SiteView renders a view in a second or two on their machines (compared to 10 seconds or more on a 486).

For really improved graphics performance, you should investigate the world of 3D graphics cards for your PC. Graphics cards can be obtained for 486 and Pentium PC's which vastly increase the speed with which your PC handles graphics. This may give you the best of both worlds, low cost and ease of use, with the performance of a high end graphics workstation. You might even be able to go into the movie biz. The cost of a graphics accelerator card is between \$250 and \$1000. SiteView 1.5, incorporating the next release of HOOPS™, will be equipped to drive at least some of these boards.

Flat surfaces

SiteView 1.0 requires that the defining values of surfaces have non-zero range. That is, the maximum value of a surface cannot equal the minimum value. If $maxval = minval$, SiteView calculates in an infinite loop. This will be fixed in SiteView 1.5.

Printing

The intense visualizations that SiteView generates also generate large postscript file sizes when sent to a printer. In some cases these file sizes may be too large for your computer or your printer. This is especially true

when you are using smoothed shading and lighting, and when you are using Z-Buffer. Z-Buffer causes SiteView to buffer the entire image in memory before drawing.

To reduce print file sizes, you should use the Production Mode hidden surface algorithm under the Options window, and use Flat surfaces under the Lighting window.

Visualization

It takes most people a little while to get used to working in true 3D. So, here are a few hints to get you started.

Perceiving 3D

What you see on the computer screen is, of course, a two-dimensional image. Lighting, reflections, shading, perspective and other visual cues “trick” your eye by mimicking what a 3D image would look like. The result is that creating a compelling 3D visualization with a 2D screen demands artistic effort.

Lights and reflection

SiteView allows you to light potatoes, surfaces, and other objects with both ambient light and a directed light source. The strength of the ambient light is about 30% of the strength of the directed light. The directed light allows you to create reflections (highlights) on 3D objects. These reflections give dimension to your images. When you first create a new 3D view, the directed light source is turned off. When you create a potato without directed light, it is difficult to see its 3D shape. So, its always good to have some directed light on when you are working. Changing the direction of the light source can have a big effect.

Note that, in SiteView 1.0 the option of placing a light source in line with the viewpoint (i.e., on the camera) is not available even though the menu option has already been placed on the lighting window in anticipation of Release 1.5.

SiteView allows you to change the color of the directed light source. This option is of negligible use when you have color shading by attribute value turned on, but can be highly effective when visualizing a potato or surface

with light colored faces. For example, try creating a potato at some constant iso-value and color its faces white or light gray. Then turn on a light source colored, say, green or red. The potato will have colored highlights on the sides facing the light source, and deep shadows on the sides facing away. In Release 1.5 we hope to have multiple directed light sources, which will allow you to highlight different faces with different color lights.

Perspective

When you turn on Perspective in the Viewpoint window, lines of sight converge away from the viewer. This mimics the normal sense of perspective that you get when viewing objects at a distance, and enhances the perception of three-dimensionality. In fact, it is difficult for most people to easily perceive 3D when perspective is not turned on.

Without perspective, a view is drawn “orthographically.” For some applications, especially in engineering, orthographic views are preferred, because they retain true distances.

One place that orthographic views are almost always preferred is when looking straight down on the site. With perspective turned off, the top-down view resembles a traditional plan view map. If you now turn Hidden Surfaces off in the View Options window, you can change the drawing order of layers and objects using the Send to Front and Send to Back commands under the View menu. These commands are useful only in the top-down view.

Viewpoint in/out vs. zoom in/out

Some people confuse moving the viewpoint in and out with using the Zoom tool to zoom in and out. These produce distinctly different results, and one or the other will usually be preferable, depending on the effect that you are trying to achieve.

Moving the viewpoint in and out from the Viewpoint window in effect creates a “walk through” of the scene. The viewpoint moves in toward the image or out away from it. As the viewpoint moves, the relative angles that different lines or surfaces make with the viewpoint change, just as if you were walking up to the scene. The Zoom tool changes the magnification of the current view, but does not change any of the relative

angles of objects in the view.

Data import

You can import data into SiteView either from DXF files or tab separated value (tsv) ASCII tables. In version 1.0, the tabular data must be formatted in rows. That is, each row in the table is a separate data object, and each column is a data field. Version 1.5 will accommodate both row and column formatted data. In Version 1.0, the “Swap Rows and Columns” toggle box does not function.

Note, you may often want to import location points (i.e., (x,y,z) point data). These should be imported as “Value Points.” A value point has (x,y,z,value) attributes. However, the value field can be left blank. The data object simply called “Point” refers to points that you create graphically using the pallet tools. If you attempt to import spreadsheet data as simple point objects, you will get an error message. If this happens, click on OK, and proceed to import the data as Value Points instead. In SiteView 1.5, the simple point data object will not appear in the pull down list of data types that can be imported.

Menu items reserved for Release 1.5

Some menu items or command options appear in SiteView 1.0 only as place holders for functionality that may appear in Release 1.5. These options are not functional in Release 1.0, and are grayed-out.