

HEC-RAS 3D Viewer

A results visualization tool

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How to start 3DViewer? Look for the cube!



HEC-RAS 6.0.0 Beta

File Edit Run View Options GIS Tools Help Debug

Project: Bald Eagle Cr. for the WCDS Project
Plan: Unsteady with Bridges and Dam
Geometry: Existing Conditions - GIS Data
Steady Flow:
Unsteady Flow: Flow Hydrograph 2
Description: Bald Eagle Creek. This model does not represent actual water surface elevations

RAS Mapper

File Project Tools Help

Features
Profile Lines
Geometries
Existing Conditions - GIS Data
Rivers
Cross Sections
Storage Areas
3D Flow Areas
Bridges/Culverts
Inline Structures
Lateral Structures
SA/2D Connections
Pump Stations
BC Lines
Wanning's n
Infiltration
Percent Impervious
Reference Points
Errors
Event Conditions
Results
UnsteadyFlow
Event Conditions
Geometry
Depth (18FEB1999 00:00:00)
Velocity (18FEB1999 00:00:00)
WSE (21FEB1999 22:00:00)
Map Layers
Terrains
Terrain5_1

Results
UnsteadyFlow
Event Conditions
Geometry
Depth
Velocity
WSE
Map Layers
Terrains
Terrain5_1

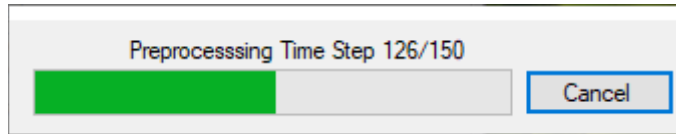
View Map in 3D Viewer

Results
UnsteadyFlow
Event
Geom
Depth
Velocity
WSE
Map Layers
Terrains
Terrain5_1

View Result in 3D



Pre-processing Results for 3D Viewer

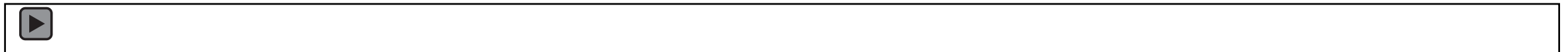


Muncie.p03.hdf	2/1/2021 7:50 PM	HDF File	15,268 KB
Muncie.p03.3DViewerCache.sqlite	3/19/2021 2:03 PM	SQLITE File	79,344 KB

No pre-processing loading example ~5.7 seconds



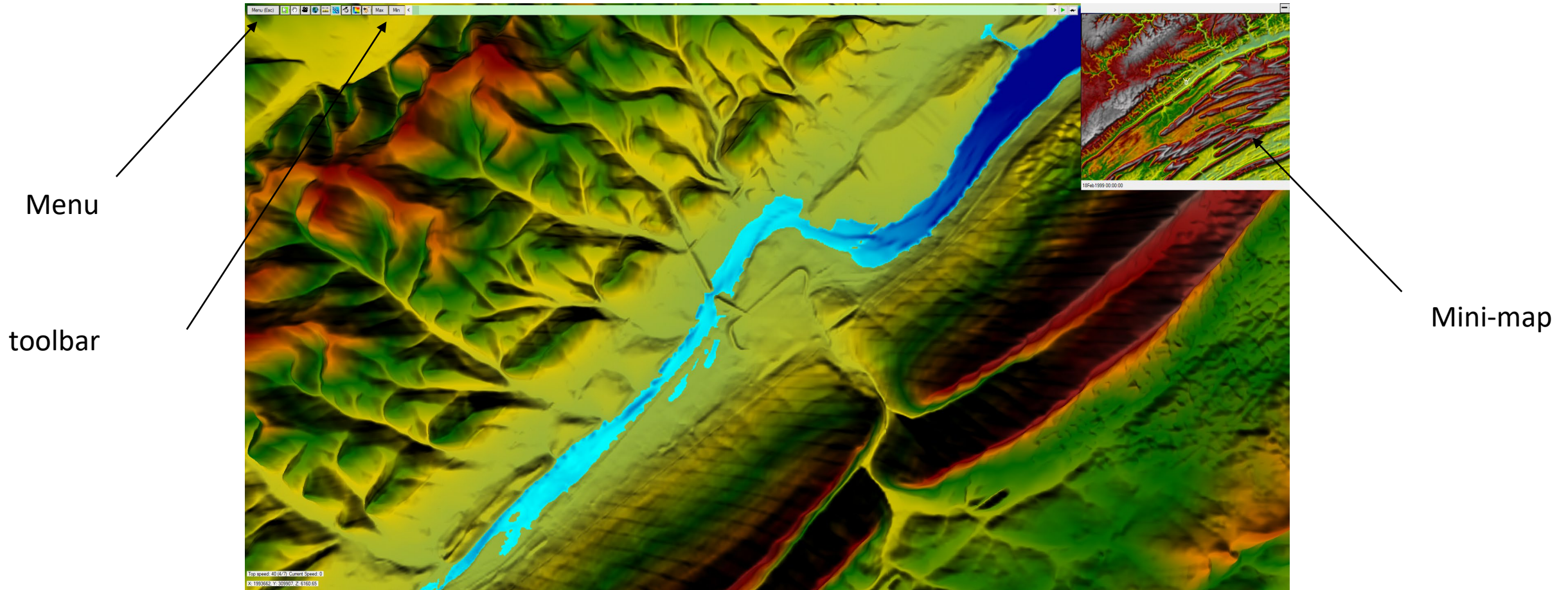
Pre-processed loading example ~1.7 seconds



File size? Approx 3x the size of the result file. Generally more profiles/time-steps and more area coverage means larger files

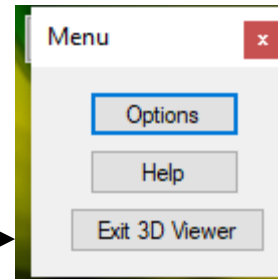


The 3D Viewer Interface



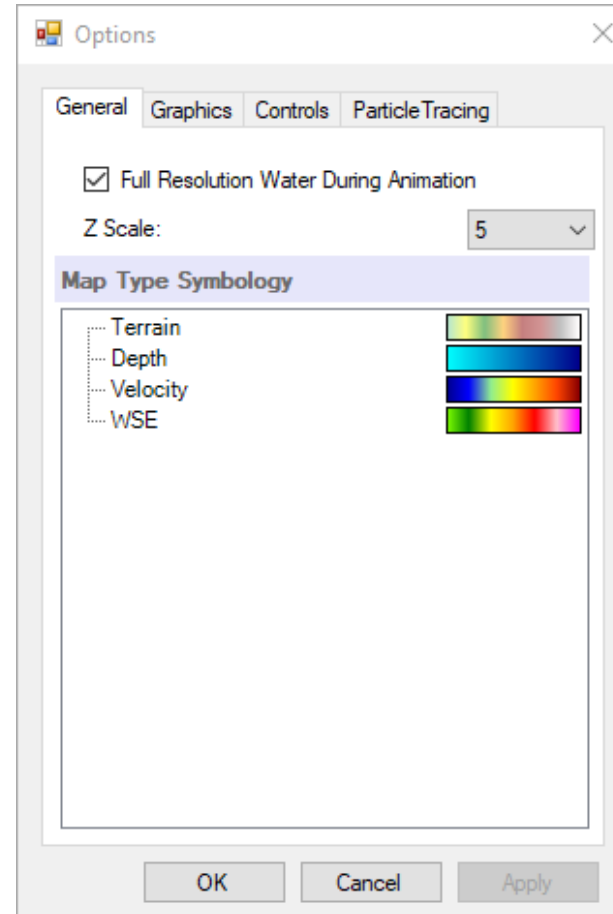


How to Access Options





General Options





Full Resolution Water During Animating



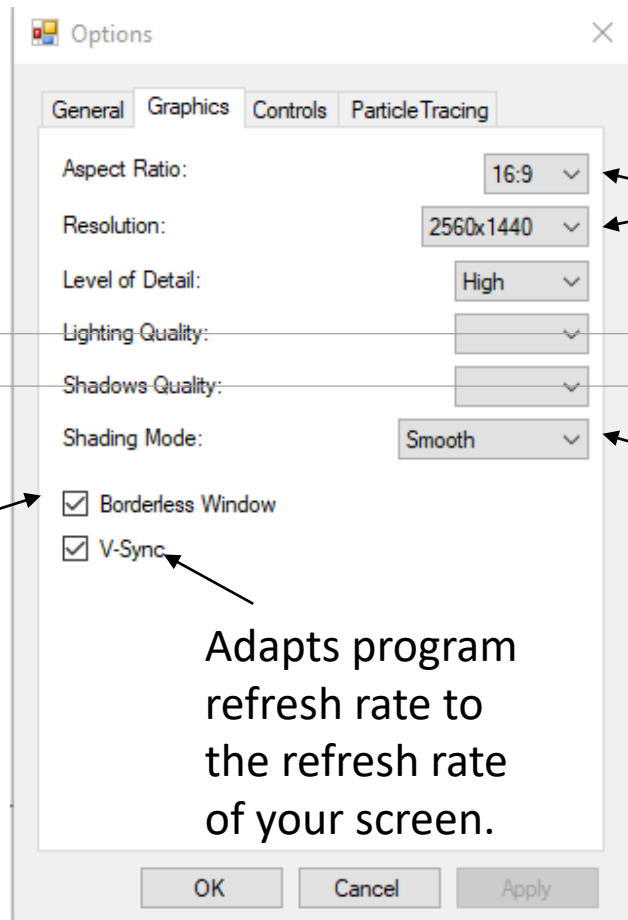


Reduced Resolution Water During Animation





Graphics Options



Control the size of the window

Control aggressiveness of tile rendering

Not used yet

Two options: Smooth and Sharp. Smooth will average the shading generated by the 3D model. Sharp will give the true shading of the 3D model. Sharp outputs 4x as many polygons as smooth, so it is less performant than smooth shading.

When checked the window is full screen. When it is unchecked the window can be moved around but mouse query is not accurate

Adapts program refresh rate to the refresh rate of your screen.

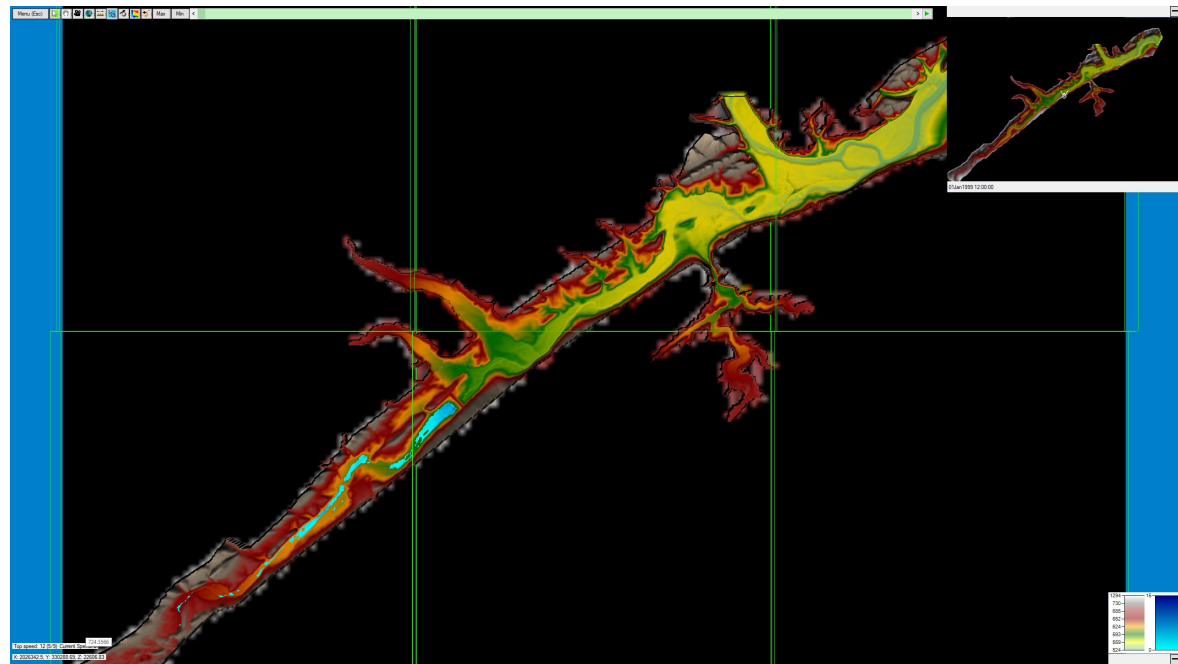


V Sync Off vs On



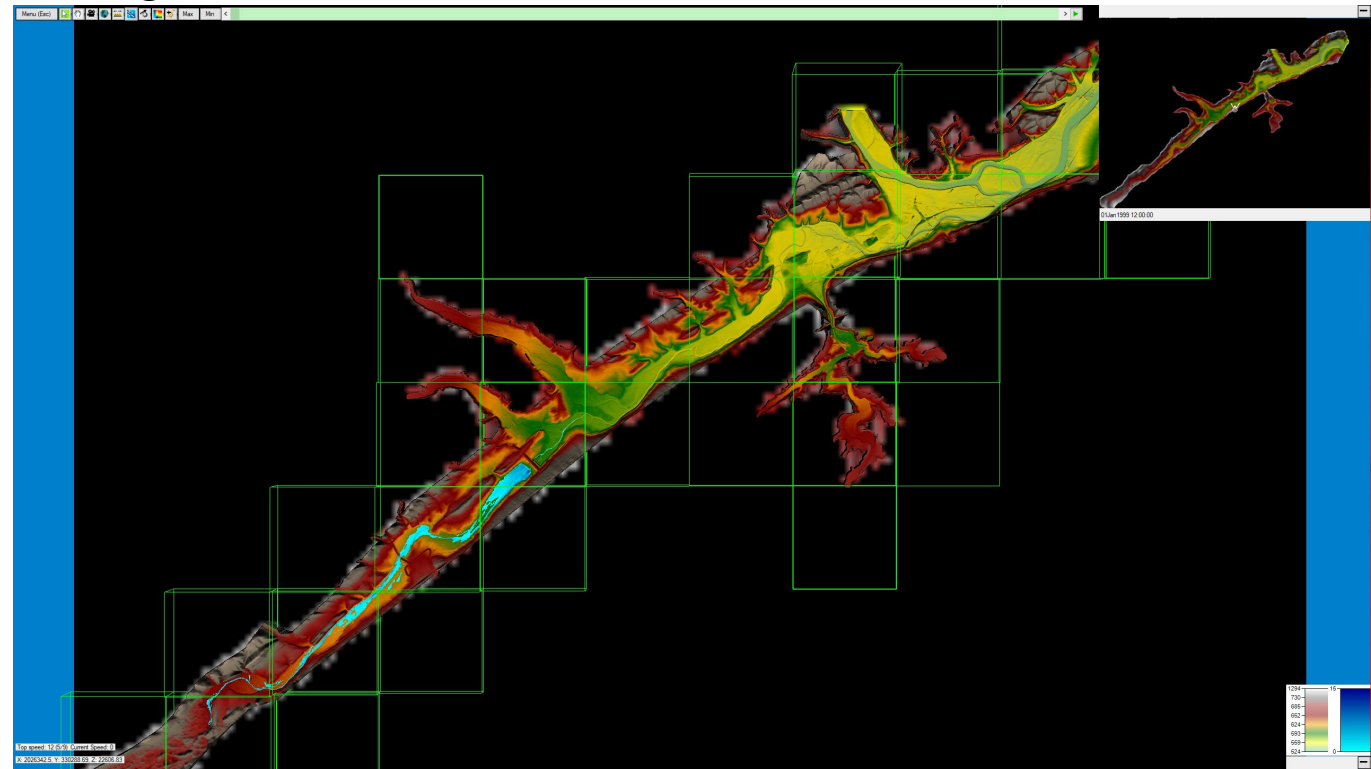


Level of Detail



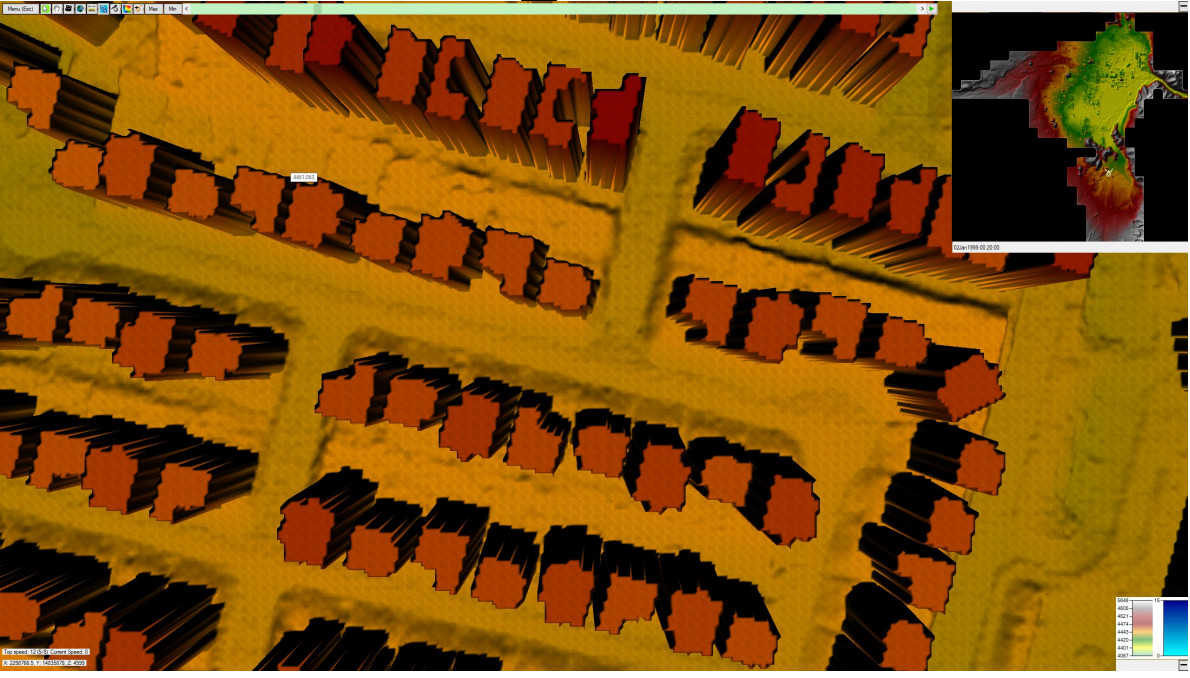
Low LOD

High LOD





Shading: Smooth vs Sharp

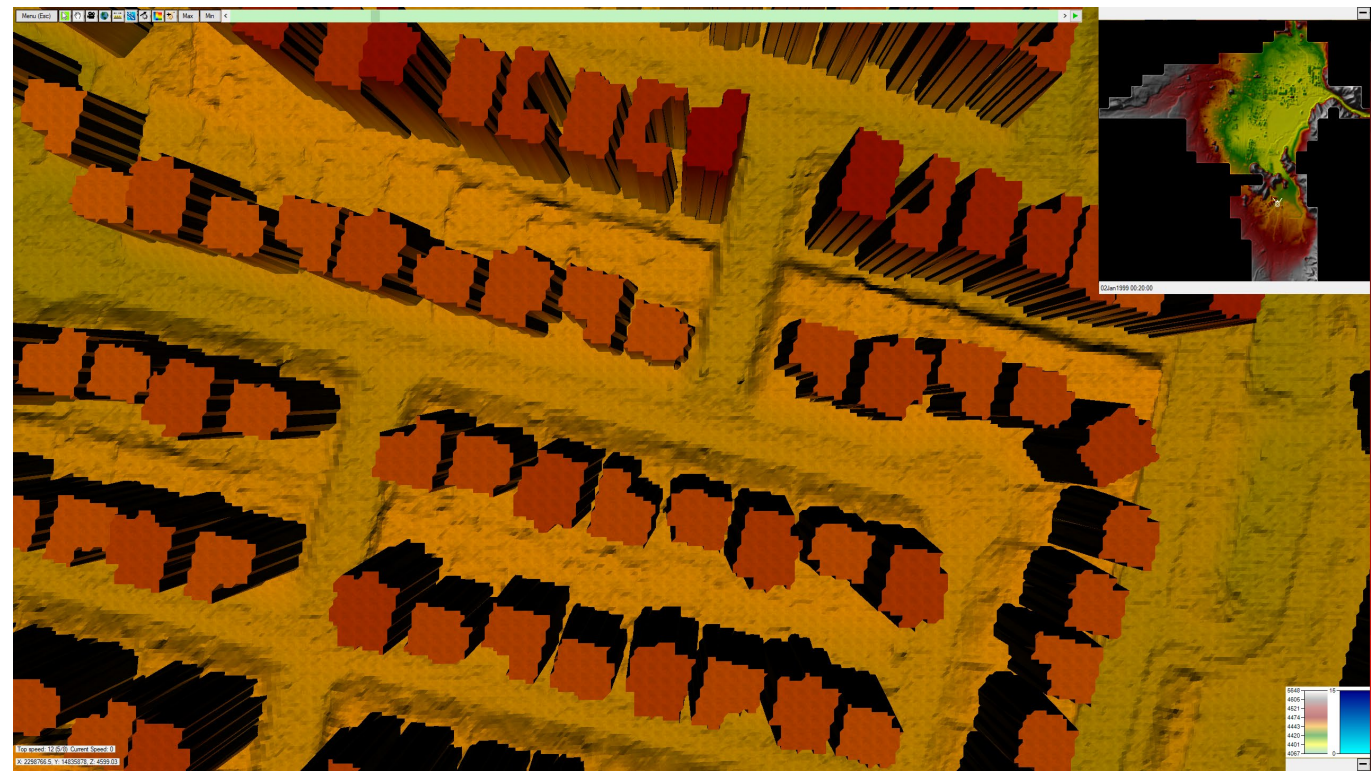


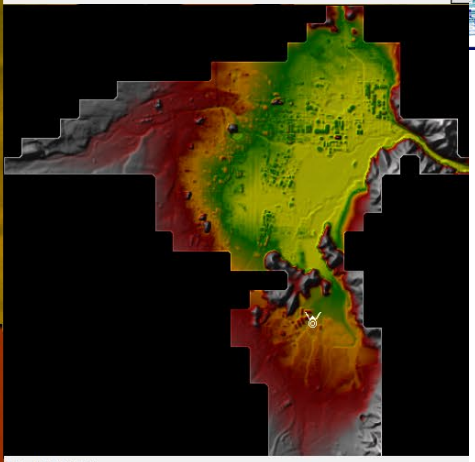
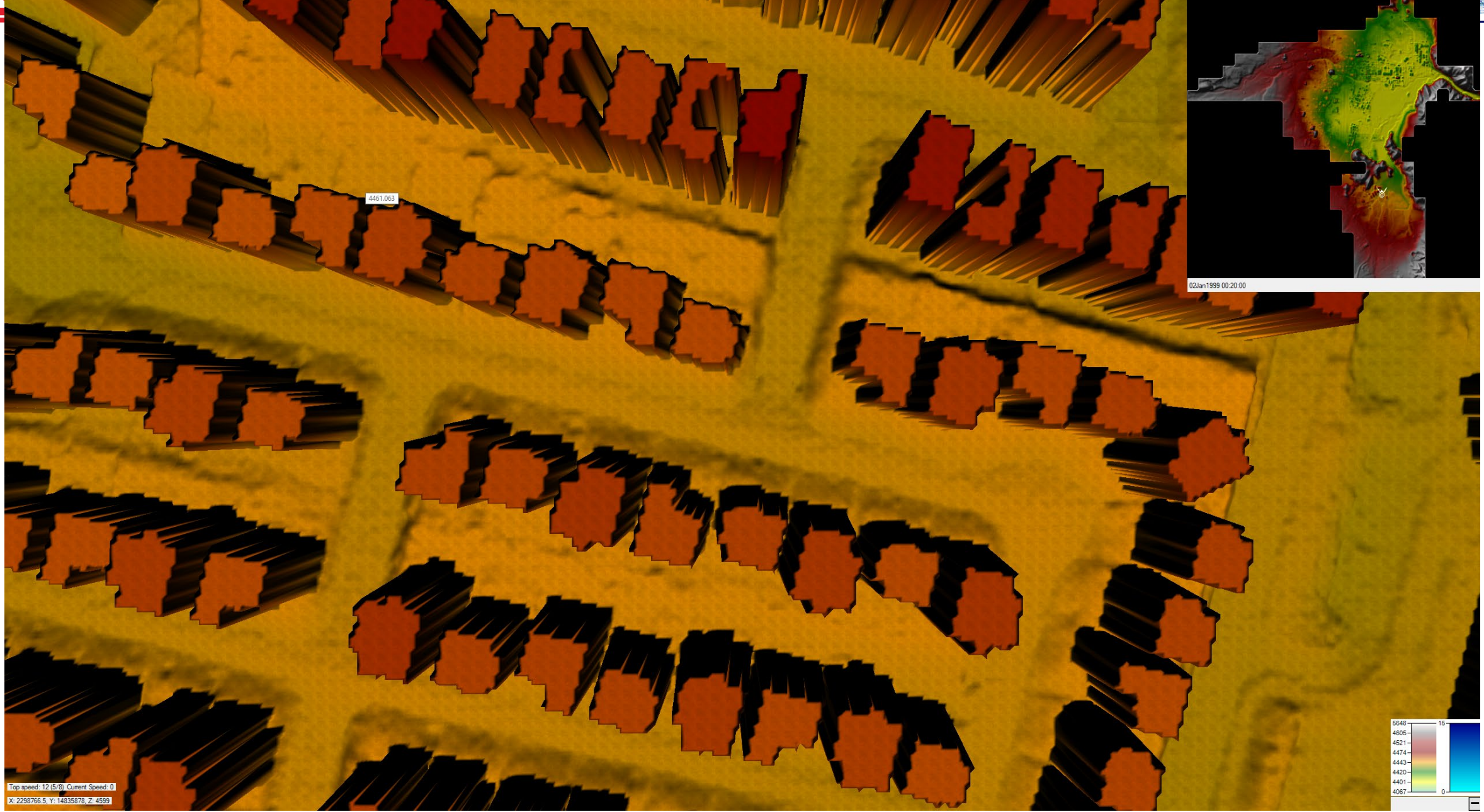
Smooth Shading

Terrain Polys Drawn: 132096

Terrain Polys Drawn: 786432

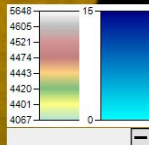
Sharp Shading

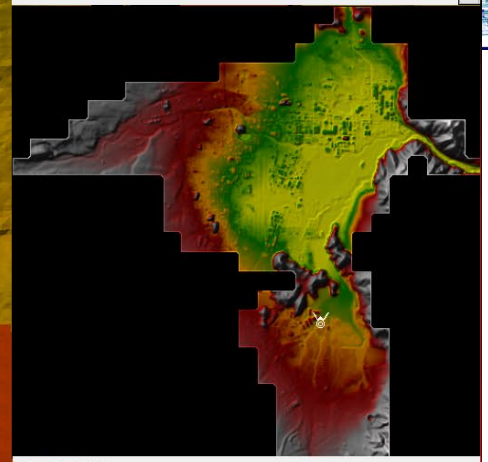
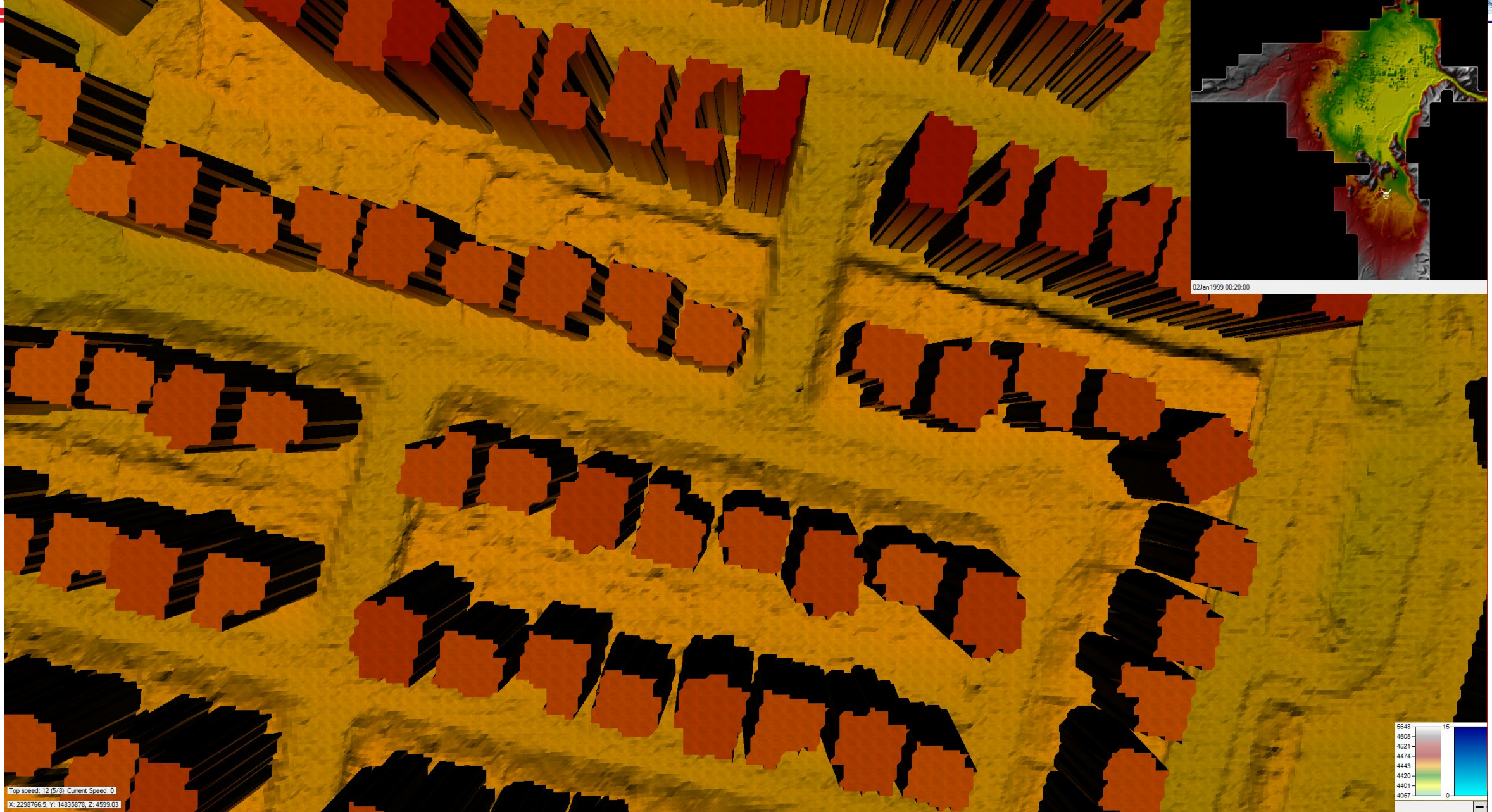




02Jan1999 00:20:00

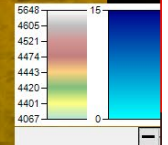
Top speed: 12 (5/8) Current Speed: 0
X: 2298766.5, Y: 14335878, Z: 4599





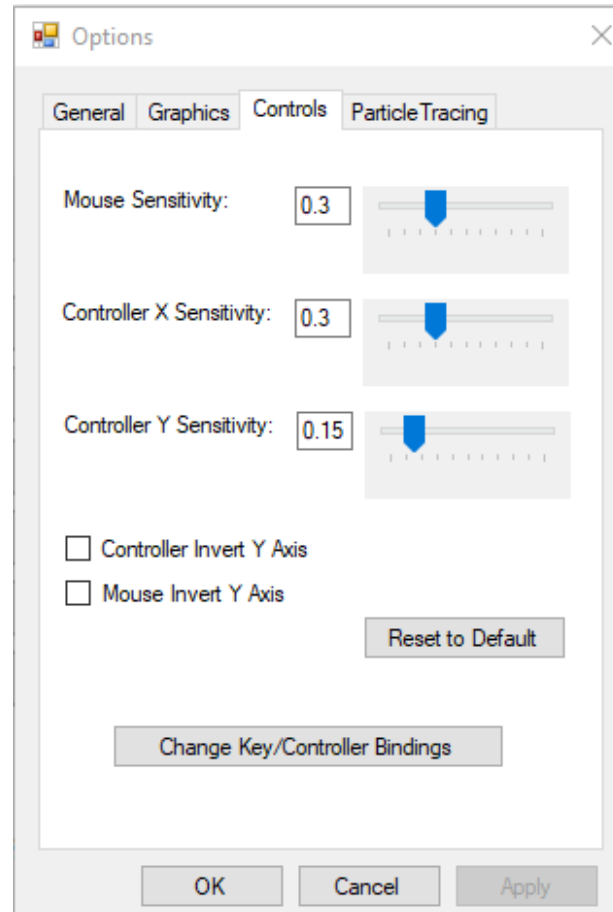
02Jan1999 00:20:00

Top speed: 12 (5/8) Current Speed: 0
X: 2298766.5, Y: 14835878, Z: 4599.03





Controls Options



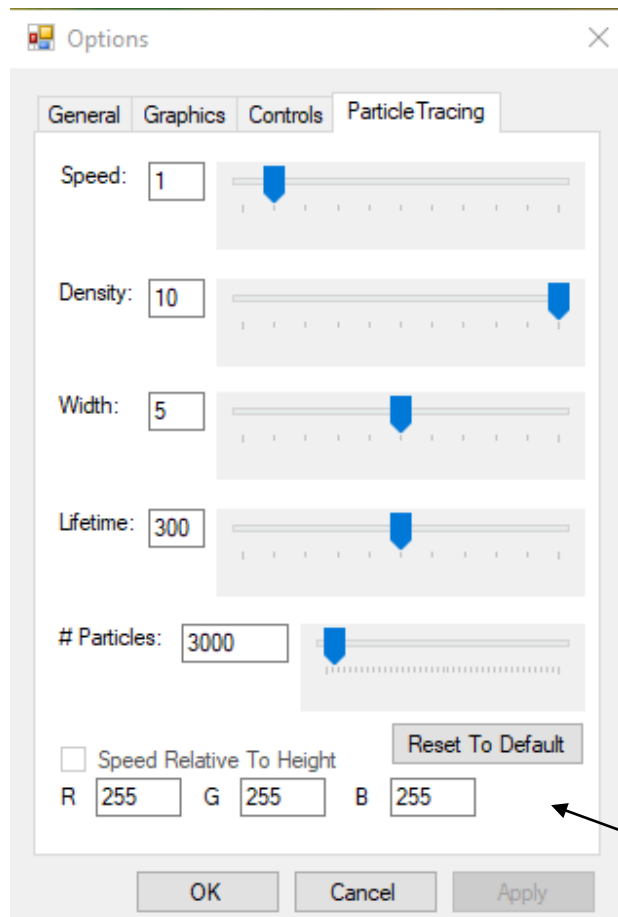


Bindings

Move Forward	W	Left Stick up	Moves the viewer forward in space
Move Backward	S	Left Stick down	Moves the viewer backward in space
Strafe Left	A	Left Stick Left	Moves the viewer in a left side-step fashion in space
Strafe Right	D	Left Stick Right	Moves the viewer in a right side-step fashion in space
Increase Elevation	Space	Right Shoulder Button	Moves the viewer up in space
Decrease Elevation	Left Control	Left Shoulder Button	Moves the viewer down in space
Change Results Map	M	North Button (Y on Xbox, Triangle on PS)	Changes the results map between 4 different maps, a realistic map, depth map, velocity map, and water surface elevation map
Toggle Particles	P	West Button (X on Xbox, Square on PS)	Turns on or off the particle tracing effect
Flight Path Play/Pause	Return (Enter)	East Button (B on Xbox, Circle on PS)	While a flight path is active, will either play the path or pause it.
Increase Viewer Speed	Right Arrow	Left Directional Arrow	Makes the viewer travel faster. The viewer can only go so fast however.
Decrease Viewer Speed	Left Arrow	Right Directional Arrow	Makes the viewer travel slower. The viewer can only go so slow however.
Turn Left	Unbound	Right Stick Left	Rotates the view to the left
Turn Right	Unbound	Right Stick Right	Rotates the view to the right
Change View Up	Unbound	Right Stick Up	Rotates the view up (No changeable binding yet)
Change View Down	Unbound	Right Stick Down	Rotates the view down (No changeable binding yet)
Toggle Mouse Pointer	Tab	Left Trigger Button	Will either show or hide the mouse pointer (No changeable binding yet)



Particle Tracing Options



Refers to the animation speed of the particle trace. Default value is 1.

Refers to concentration of tracers in an area. Default value is 1.

Refers to the width of the particle. Default value is 5

Refers to how long the particle exists on screen before it disappears and a new particle spawns in its place. Default value is 300.

Refers to how many particles are shown at any one time. Default value is 10,000.

Changes the color of the tracers. Each field accepts an integer between 0 and 255. R/G/B = Red/Green/Blue



Default Mouse Sensitivity Demo (0.3)














Increased Mouse Sensitivity (1.0)










Toolbar



Tool		Description
Select		<p>Wherever the Select cursor hovers, it will show the value of either the terrain elevation or water surface value, dependent on the selected map type.</p> <p>While using the Select cursor, it is possible to navigate through the terrain through middle-clicking and dragging on the terrain.</p>
Pan		<p>Left-click and drag with the Pan cursor to navigate through the terrain.</p>
Change Camera Modes		<p>Allows you to change how the 3D Viewer is controlled.</p> <p>When in helicopter mode  , the viewer will move forward, backward, left and right on a plane. Elevation is controlled by the elevation Up and Down keys</p> <p>When in airplane mode  , the viewer will move forward in space in relation to where it is currently looking. For example, this means that looking straight up and going forward will cause the viewer to go straight up. (Not Implemented Yet)</p>
Zoom to Entire Extent		<p>Zooms to the maximum viewable extent of the terrain, and forces the viewer to look straight down.</p>
Measure Tool		<p>Measure the distance in map units. (Not Implemented Yet)</p>
Toggle Particle Tracing		<p>Toggles whether particles show on the water surface.</p>
Particle Tracing Options		<p>A shortcut to get to Particle Tracing Options.</p>

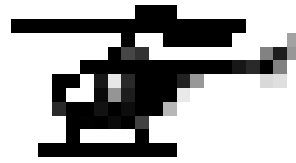


Toolbar Continued..

Change Results Map		Changes the results map between four different maps: a realistic map, depth map, velocity map, and water surface elevation map.
Select a Flight Plan		Opens the flight plan window to choose a flight plan. See Flight Plans/Paths section for more information.
Set to Simulation Maximum	Max	Sets the water surface to simulation maximum.
Set to Simulation Minimum	Min	Sets the water surface to simulation minimum.
Animation Bar		Change the animation bar position to change the time of the simulation. When a portion of the animation bar is grey, it means that the simulation has not loaded at that time yet.
Play/Pause		Plays or pauses the animation.
Change Animation Speed		Changes the delay before changing time step in the animation. Note that there is an inherent delay that is unavoidable for each time step. That delay depends on whether you pre-processed the dataset, and whether you have high resolution water turned on during animation. (Not Implemented Yet)



Helicopter Mode

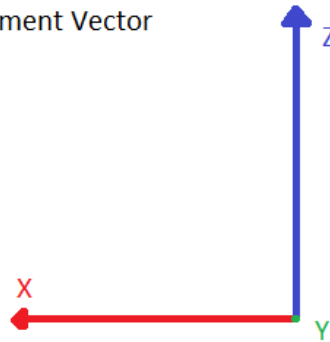


Movement vector stays constant, no matter the view.
View vector changes with view

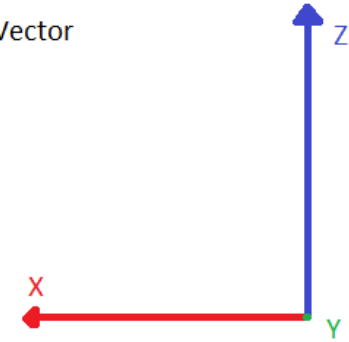
0 Degrees view



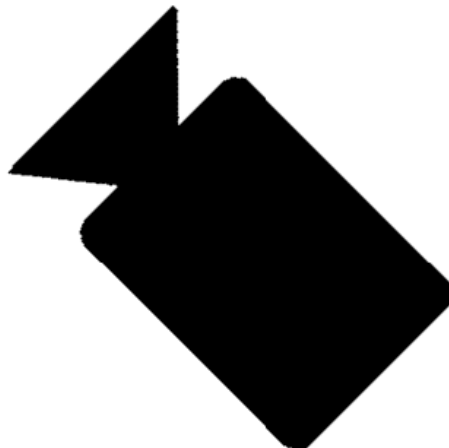
Movement Vector



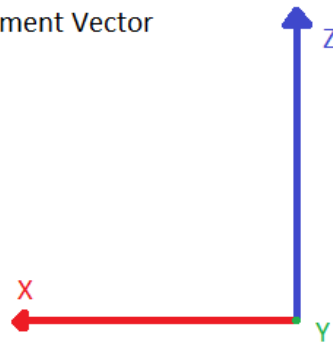
View Vector



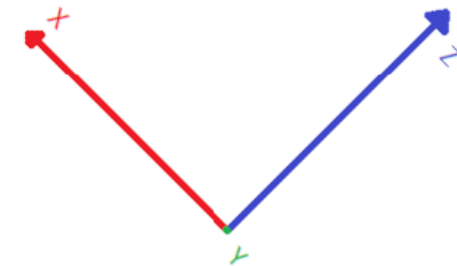
45 Degrees view



Movement Vector

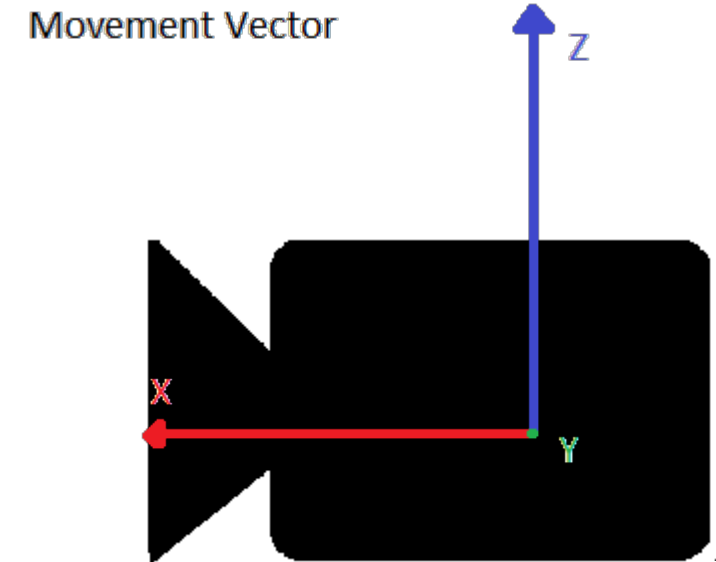


View Vector





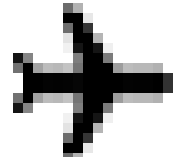
Helicopter Mode Demo



Pressing forward key



Airplane Mode

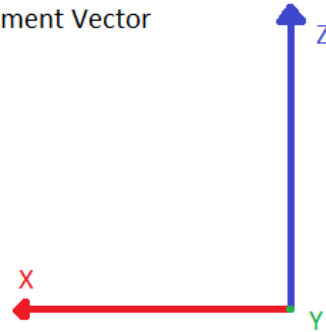


Movement AND view vector always match view

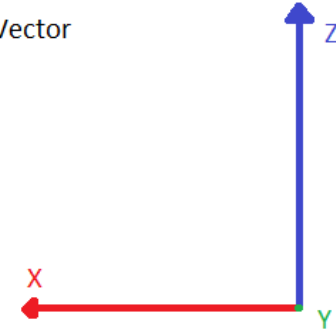
0 Degrees view



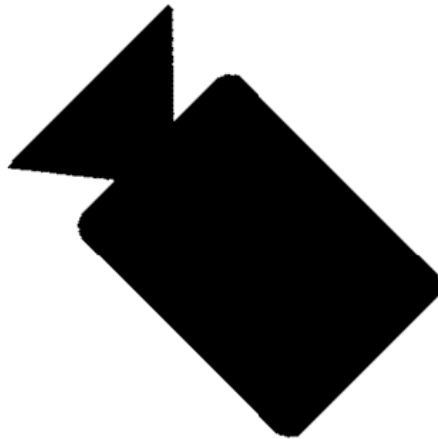
Movement Vector



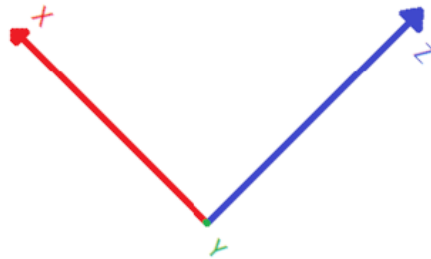
View Vector



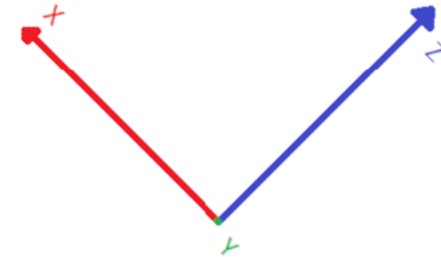
45 Degrees view



Movement Vector



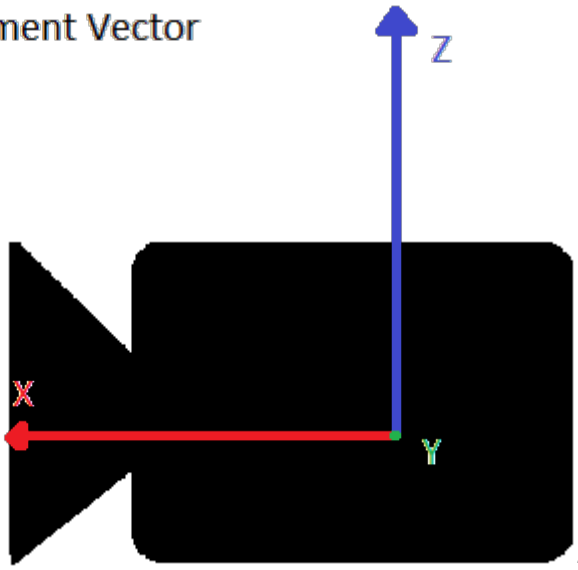
View Vector





Airplane Mode Demo

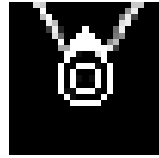
Movement Vector



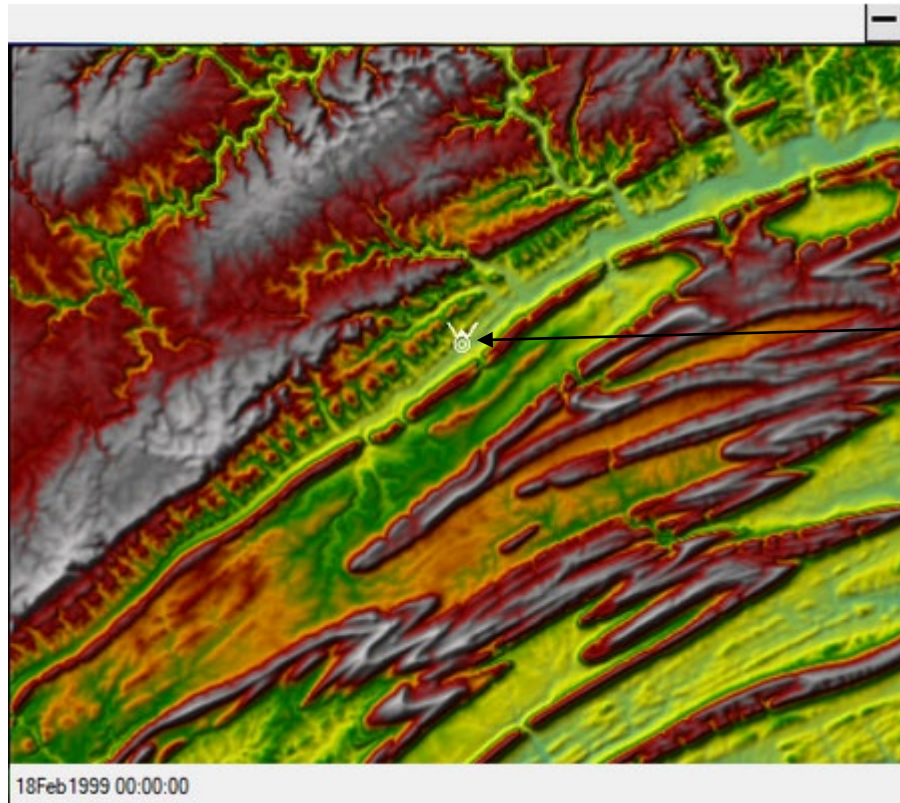
Pressing forward key



Minimap



Hide/Show Minimap



Viewer location and direction currently being viewed

18Feb1999 00:00:00

Profile Name/Date



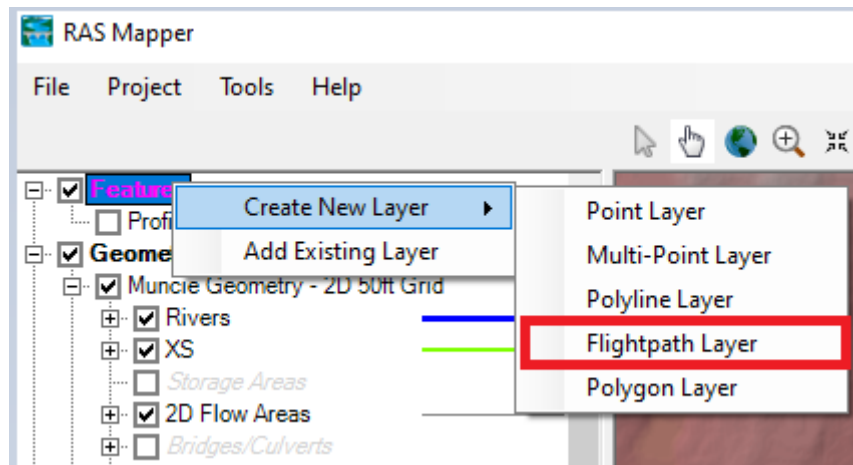
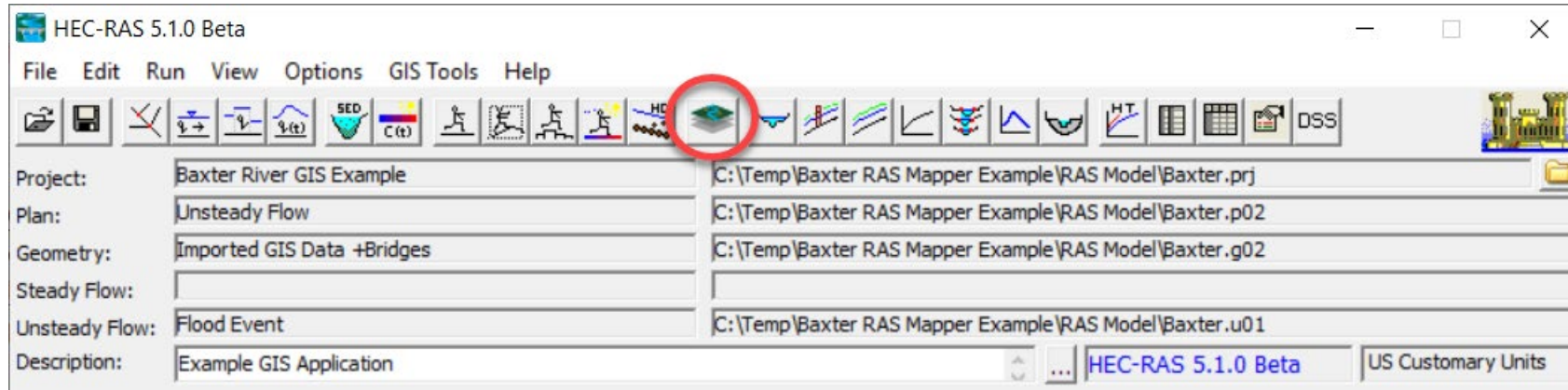
Minimap – A Fast Way to Travel

Click anywhere on the map to instantly be transported to that spot in the viewer





Flight Plans – How to Make Layer





Flight Plans - Continued

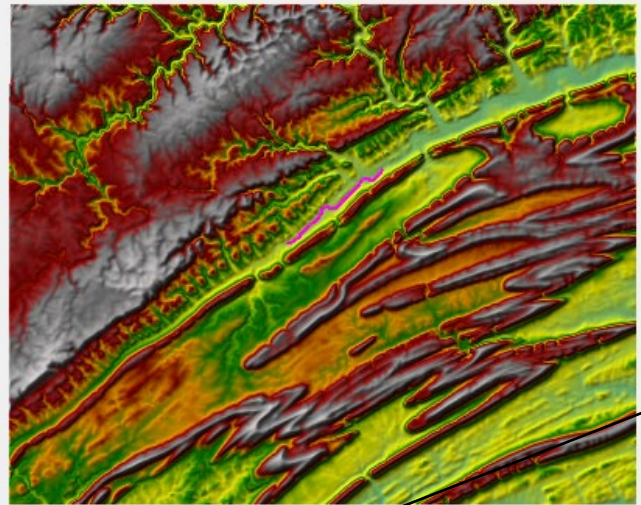


Select a Flight Plan button

Flight Plans

Select a polyline shape file you created in RASMapper. Usually you can find it in the Features folder of the dataset.

Shape File (.shp)



Select a Flight Path

- Polylines.XY
- Constant elevation
- Offset from the terrain
- Always look forward
- Allow free look
- Start from the first point in polyline
- Start from last point in polyline

Pitch (Degrees):

Offset:

Select the flight path layer you created

Acts like a camera strapped to the front of a minecart or train. Camera rotation changes with path rotation

Camera will always look in the same direction, requires user control to change.

Select the specific flight path from the layer

Questions?