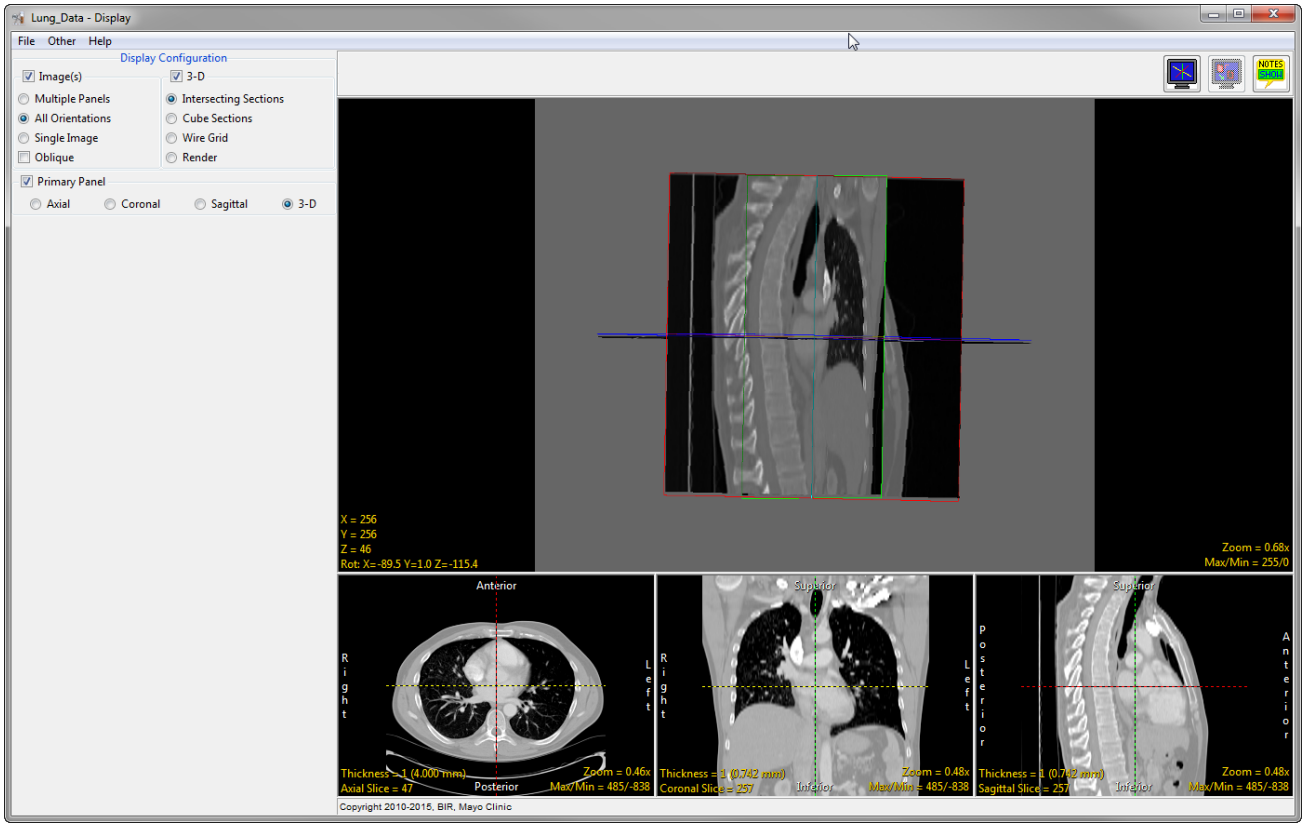
# 3D Images

The 3D checkbox adds a 3D display window to the current collection of displays and enables the selection of the type of 3D visualization depicted in the 3D display window.

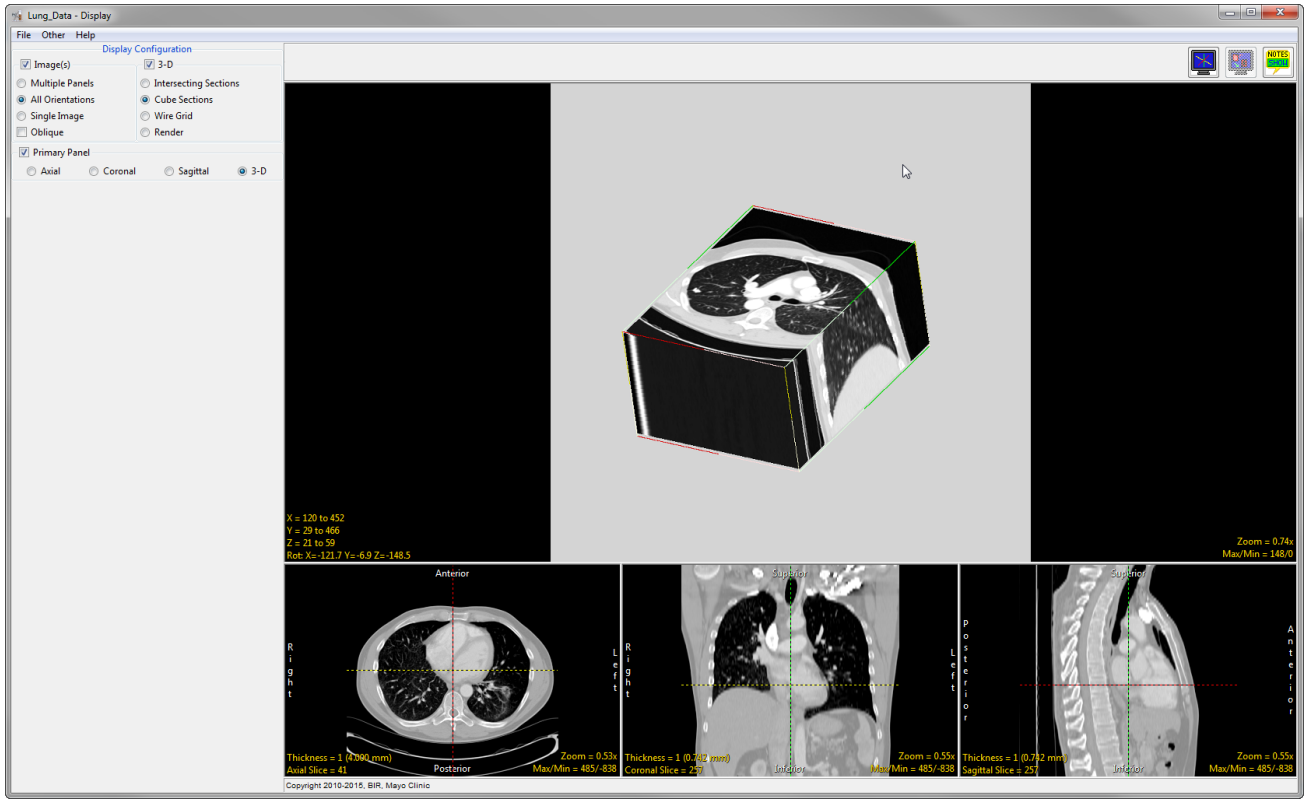



## Intersecting Sections

The Intersecting Sections option displays a 3D data set via orthogonal section displays. Intersecting Sections shows three slices that can be controlled using the X/Y/Z values in the image display or interactively selected by choosing the planes in the intersecting sections display.

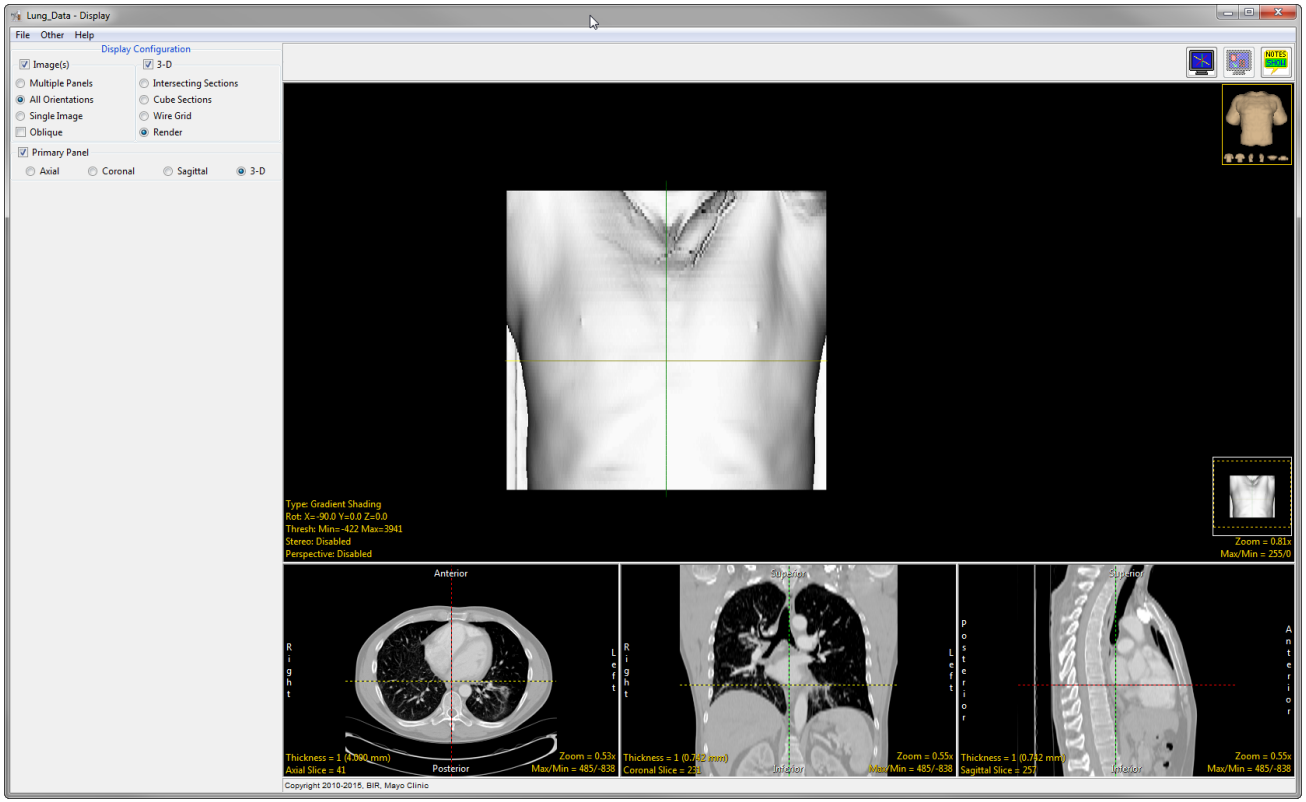
# Cube Sections

The Cube Sections option shows images on the face of a cube representing the data set, with controls to select the slices numerically in the window or by interactively grabbing an image on the cube.

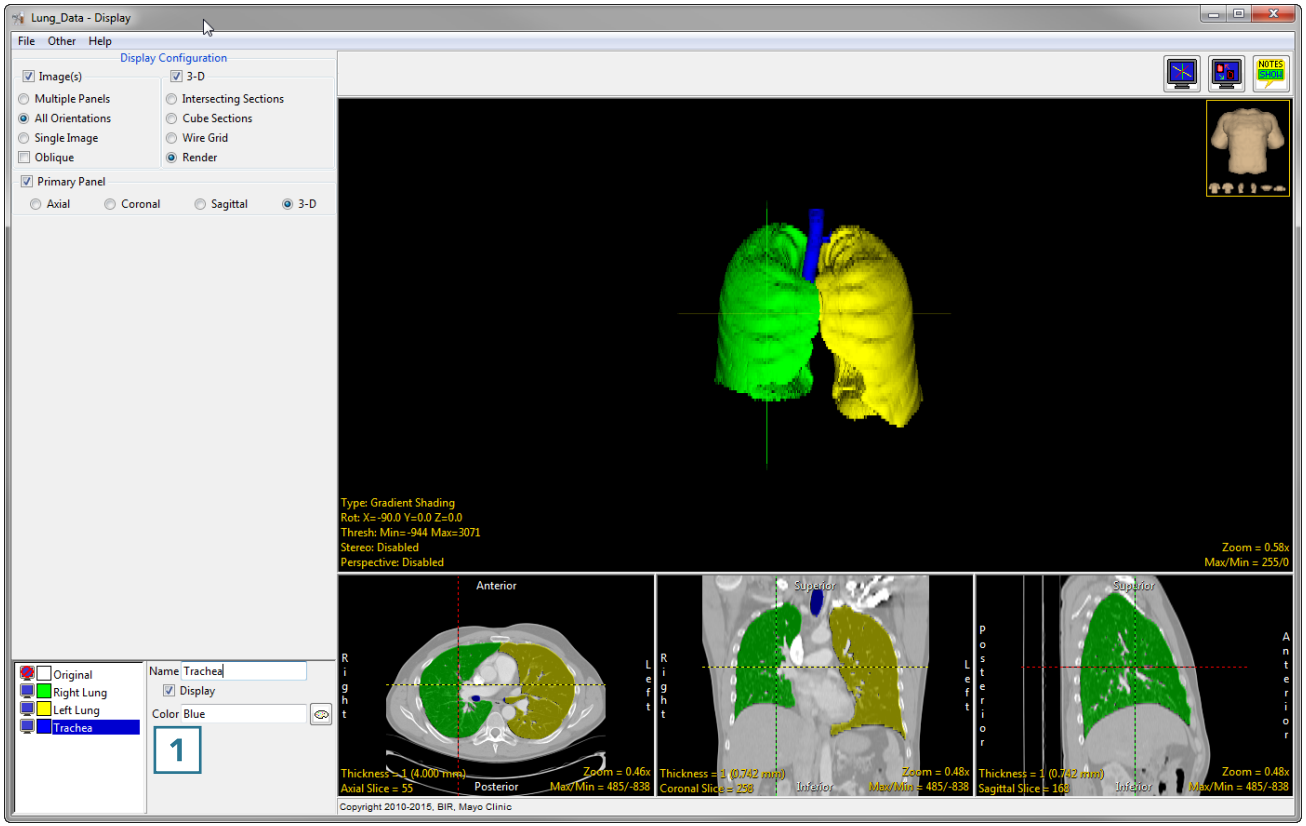


# Render

The Render option enables a 3D volume rendering in the 3D display window. By default, a voxel gradient shaded rendering is shown, with controls for threshold selection and rotation angle. Clicking and dragging the rendering with the middle mouse button controls rotation angle.

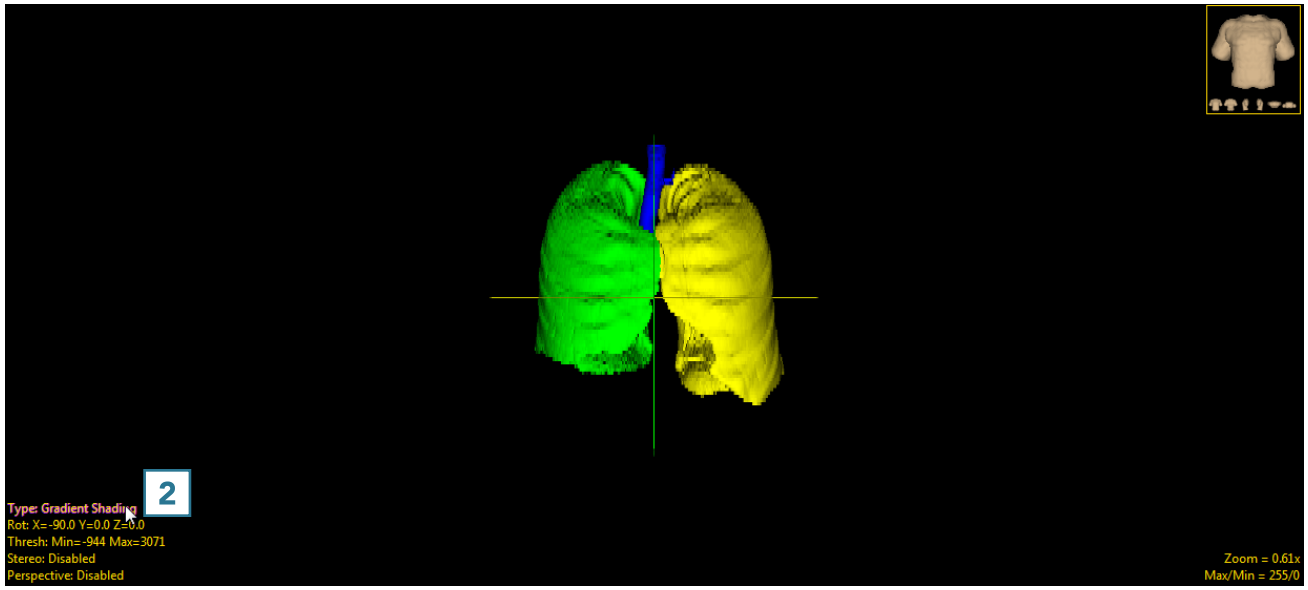


If an object map was assigned to the volume or loaded using File > Load Object Map, all images will be displayed with the associated objects. The controls 1 for the object map name, colors and visibility will be available at the bottom left of the module window.



Alternative 3D render types can be selected by clicking the Type 2 text in the bottom left corner.

For more information about Render Types, refer to Table 4.1: Display Rendering Types.



## Table 4.1: Display Rendering Types

| Render Type | Description |
|---|---|
| Depth Shading | The value of each output pixel is a function of depth only. The depth of the first renderable voxel found along the ray path is used to determine the brightness of that voxel. Closer voxels will appear brighter than more distant voxels. |
| Gradient Shading (Default) | The grayscale gradient vector is computed using a 3D neighborhood about the surface voxel. The value projected at each output location is the dot product of the gradient vector and an independently specified light source vector. This simulates the appearance of a reflective surface under uniform-field illumination. |
| Volume Compositing | Volumetric compositing integrates the gradient-shaded value of all voxels along the ray path. The contribution of each gradient-shaded voxel value is weighted by color and opacity values. The color and opacity information for each intensity is specified using the Alpha map window. |
| Maximum Intensity Projection | The maximum voxel intensity along the ray path is used. |
| Summed Voxel Projection | The average of all voxels along the ray path is used. |
| Surface Projection | The algorithm searches down the ray for a voxel that is within the current threshold range. Then, it skips the first S voxels along the ray, where S is specified by the Surface Skip value. Last, it returns the average of the next T values, where T is specified by the Surface Thickness. The surface projection rendering can be limited to enabled objects if an object map is loaded. |
| Object Compositing | Available only when an object map is loaded with the data set. Produces 24-bit color renderings where the voxel mapping along each ray path is controlled by the Composite Type yellow text. |