



# Intro to VRAY for SketchUp

By Eric Sargeant, Online Learning Content Producer | DRAFT June 2019



## Purpose & Contents



## Purpose

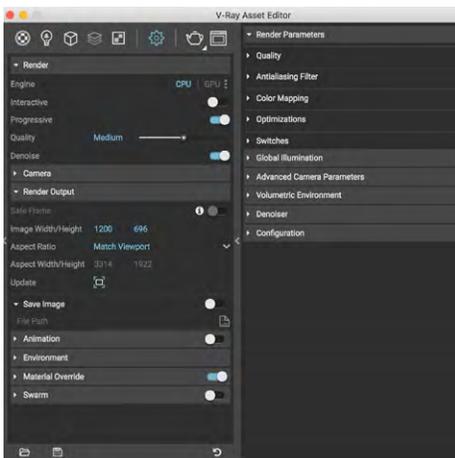
This guide is a high-level overview of the core features for getting started with V-Ray 3.4-NEXT for SketchUp 2019.

The power of VRAY is in its customizability and the level of detail it offers its users in creating incredibly realistic renderings...but on the flip side, for new users, it can be overwhelming knowing where to start or what to look for.

The primary goal of this guide is to focus on the minimum tools and settings to get both good and quick results. This guide condenses the essential concepts into 6 easy to follow sections – which provide just enough info to get you up and running. Other than the first section, 'Toolbars & interface', the other sections are presented in a logical fashion but are not required to be followed in order and therefore can be skipped or skimmed as desired.

If you have questions regarding the topics covered or the source material presented within this guide, please post to the SketchUp Community Forum page specific to this guide here: [xxx](#) or contact the author at: [erics@sketchup.com](mailto:erics@sketchup.com)

## Contents



1. Toolbars & Interface



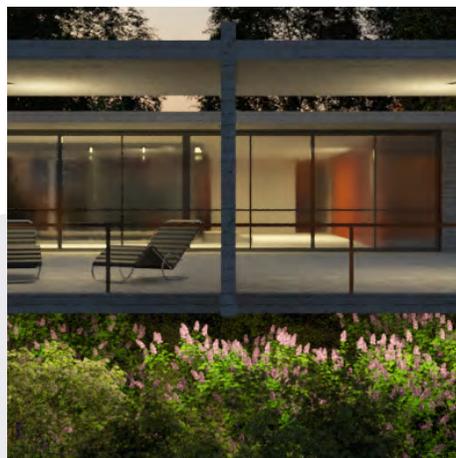
2. Materials



3. Objects



4. Environment



5. Lighting



6. Output

# Reference Model

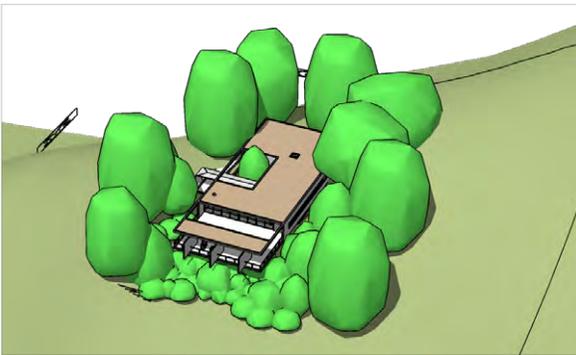


## Original

The model used for this demo is the Federmann House, designed by architect Oscar Niemeyer.

Get it from 3D Warehouse:

<https://3dwarehouse.sketchup.com/model/02bfb89d-4598-485b-857b-44fae0f65ae8/Modern-House>



## Final VRAY-Ready Model

Edited VRAY model with settings applied can be downloaded here:

[https://www.dropbox.com/s/naiivkb36973gc6/Casa%2BFedermann\\_VRAY.zip?dl=0](https://www.dropbox.com/s/naiivkb36973gc6/Casa%2BFedermann_VRAY.zip?dl=0)

\*Note trees are from Laubwerk (free extension, paid library) found here:

<https://www.laubwerk.com/store/plants-kit-freebie/>



Final render combining elements of the six (6) core topics covered in this guide.



## 5 Minute Quick-Start Render Exercise

## 5 minute quick start render demo:

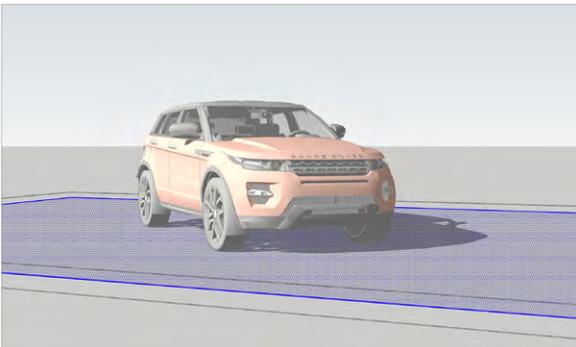
Let's ease into things with a quick confidence-building exercise to get you started. If you've used VRAY before, feel free to skip this step.



### Step 1

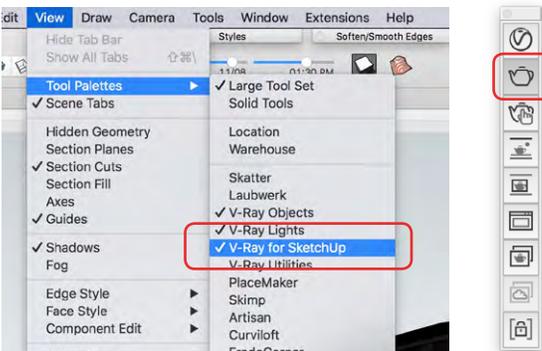
Download this car, or any other model from the 3D Warehouse with the search keyword 'VRAY Ready'.

<https://3dwarehouse.sketchup.com/model/a3517440-3d9f-4a44-8046-f5bba04a01f3/CAR-REANGE-ROVER-VRAY-READY>



### Step 2

Draw a rectangle on the ground to give the car something to sit on and something for its shadows to cast onto.



### Step 3

Click the Render button (teapot icon) on your VRAY for SketchUp tool palette.



That's it! Pretty easy huh?

FYI - searching for 'VRAY Ready' or 'Render Ready' models should produce results with VRAY materials and settings already applied, potentially making it a larger file size, but speeding up the render process significantly by freeing you up to focus on other settings.



 SketchUp

- ▶ Render
- ▶ Camera
- ▶ Render Output
- ▶ Animation
- ▶ Environment
- ▶ Material Override
- ▶ Swarm

- ▶ Render Parameters
- ▶ Global Illumination
- ▶ Advanced Camera Parameters
- ▶ Volumetric Environment
- ▶ Denoiser
- ▶ Configuration

## 1. VRAY Toolbars & Interface

# Toolbars



## VRAY Render Toolbar

This is the main toolbar that provides access to the Asset Editor (settings) panel as well as your render buttons.



## VRAY Objects Toolbar

These are objects you can add to your model.



## VRAY Lights Toolbar

These are lights you can add to your model.

\*You can find the VRAY toolbars in the same location as others: View/Tool Palettes/...

# Toolbars - Tools

-  — Asset editor (aka settings)
-  — Render
-  — Interactive (aka real time (RT)) render
-  — Viewport render
-  — Viewport render region
-  — Frame buffer
-  — Batch render
-  — Cloud batch render
-  — Lock camera orientation

-  — Infinite plane
-  — Export proxy
-  — Import proxy
-  — VRAY fur
-  — Mesh clipper

-  — Rectangel light
-  — Sphere light
-  — Spot light
-  — Omni light
-  — IES light
-  — Dome light
-  — Convert to mesh light

\*Faded items will not be discussed in this high level overview

Asset editor (aka settings)



Geometries (Objects)

Materials   Lights   Render Elements   Textures   Render Settings (Shown)   Render   Frame Buffer

V-Ray Asset Editor

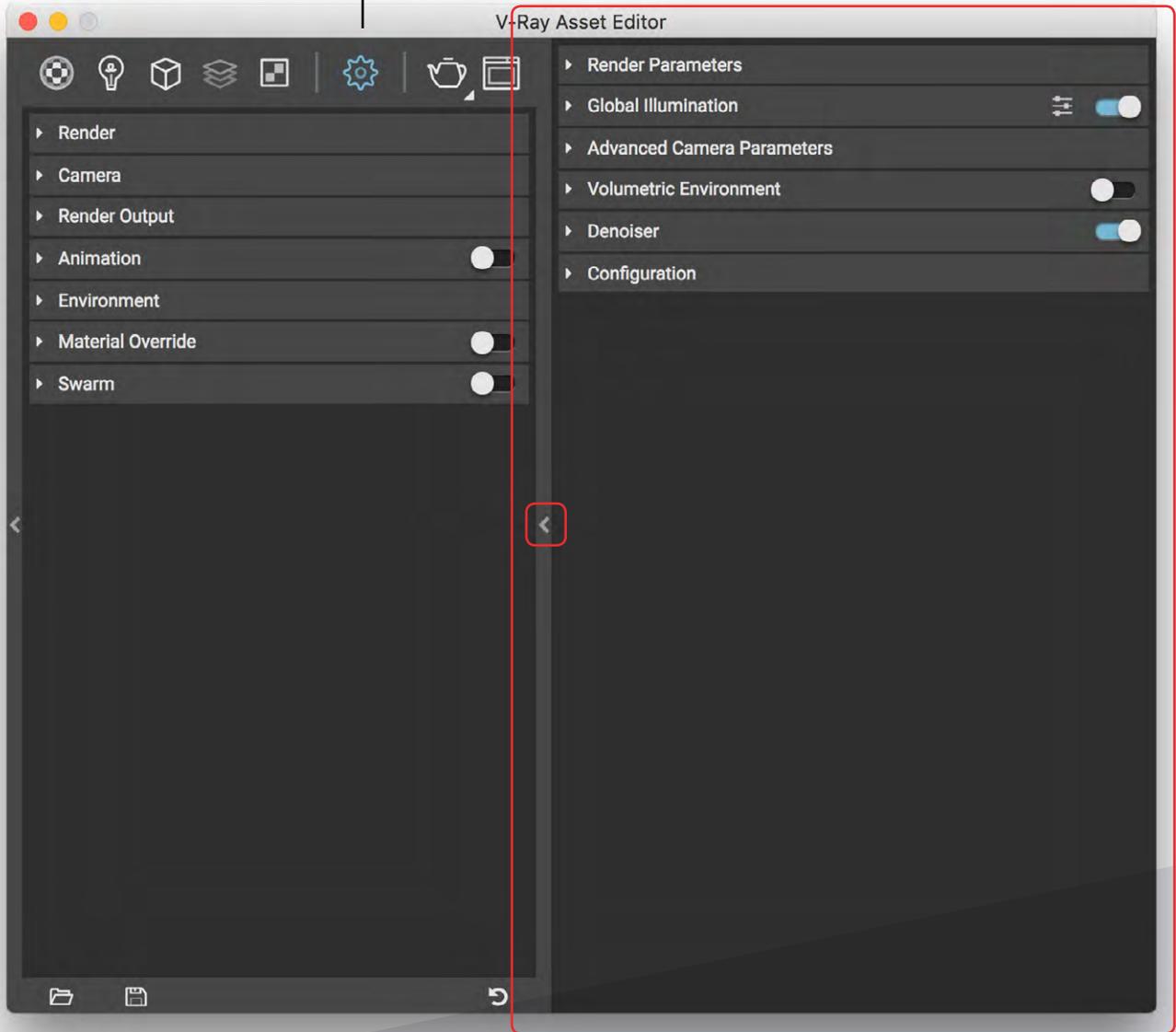
Render   Camera   Render Output   Animation   Environment   Material Override   Swarm

Expand < > Expand

\*Faded items will not be discussed in this high level overview, typ.

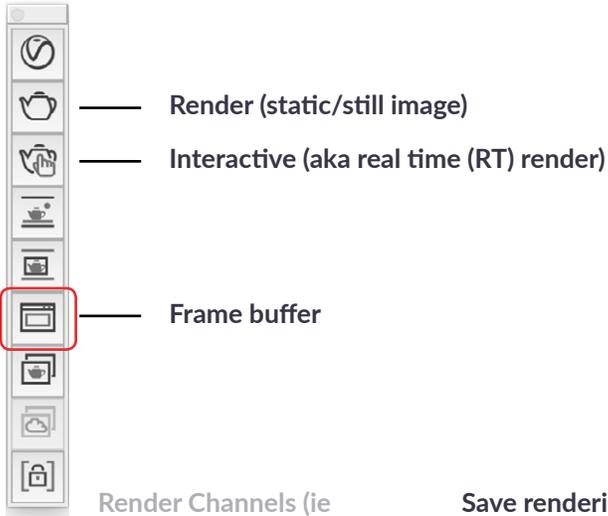
Asset editor (aka settings)

Render Settings  
(Expanded)



Expand window to see more settings →

\*We'll come back to this panel at the end in section 6, 'Output'.



### Frame buffer

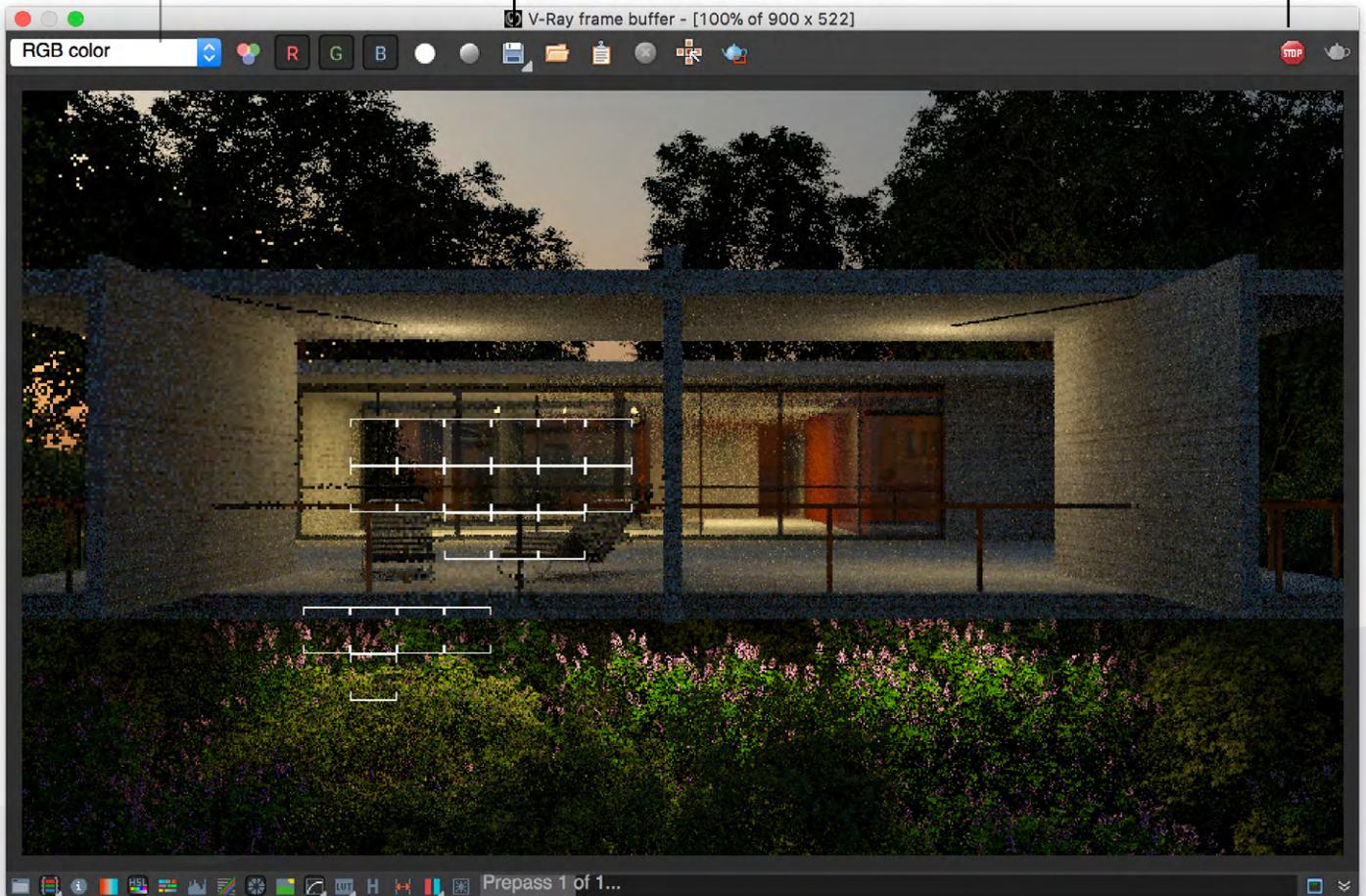
Works the same for both static and interactive (real time) renders. Render shows up as separate window that floats above SketchUp and can be moved to second monitor (if available) to keep SketchUp window clear.

Closing the frame buffer and re-opening it brings back the previous rendered image. Image remains until new render has started. \*Closing the frame buffer does not mean that a render is stopped. Make sure to press 'Stop' first before closing.

Render Channels (ie alpha, depth, MatID, etc...)

Save rendering (see Section 6, Output for more info)

Stop render



Additional editing settings

Progress indicator



— Viewport render

### Viewport render

This is a newish feature, similar to Interactive render, only it displays in the SketchUp window itself vs the floating Frame Buffer.

Panning or zooming, as well as making changes to the model will update the render in real time.





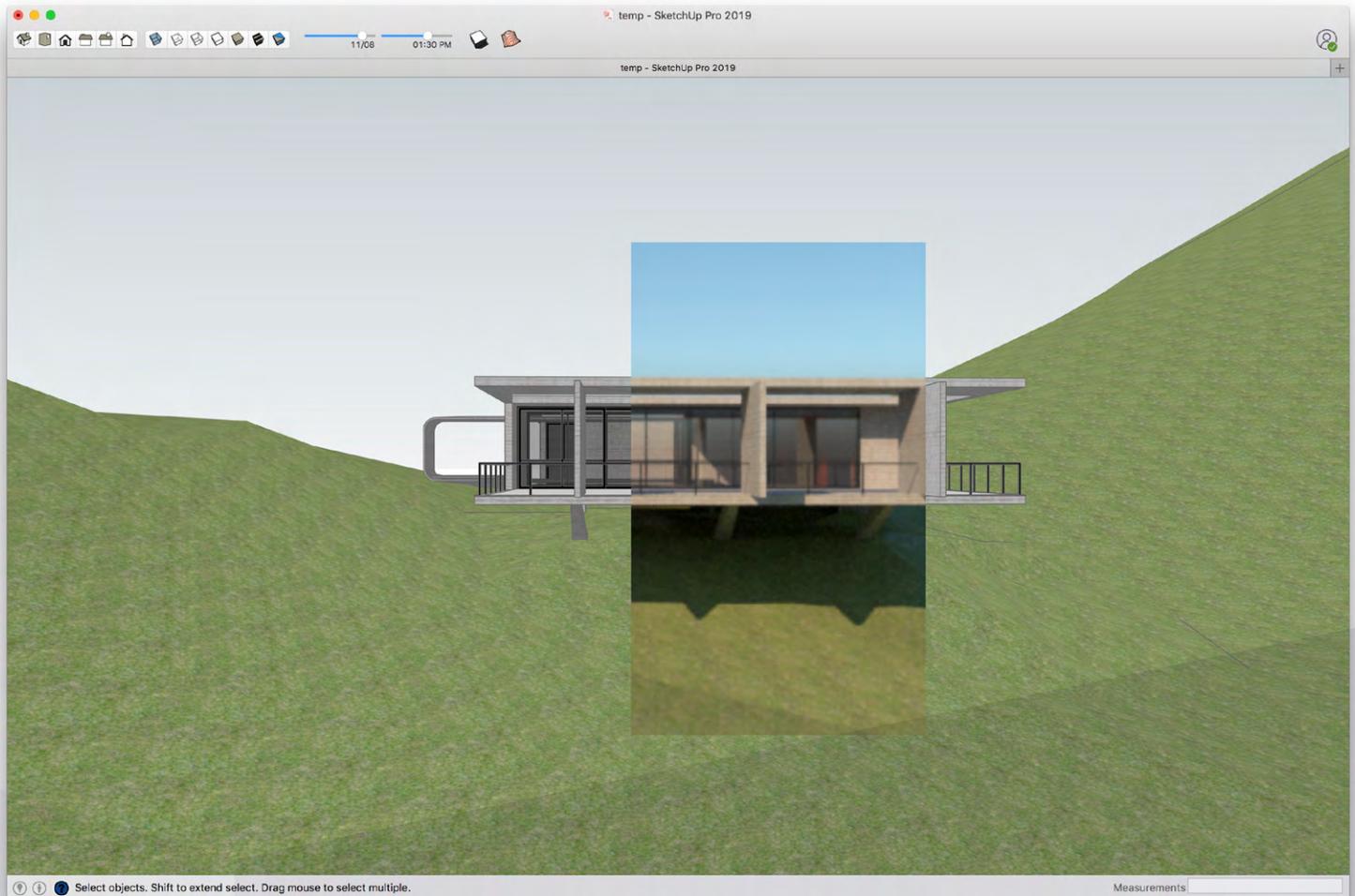
— Viewport render region

### Viewport render region

You can select just a part of the viewport to render. This is a nice option as it doesn't cover the entire model, allowing you to work and render at the same time and see the result of your changes.

Rendering smaller regions also uses less computing power and runs faster than larger renders.

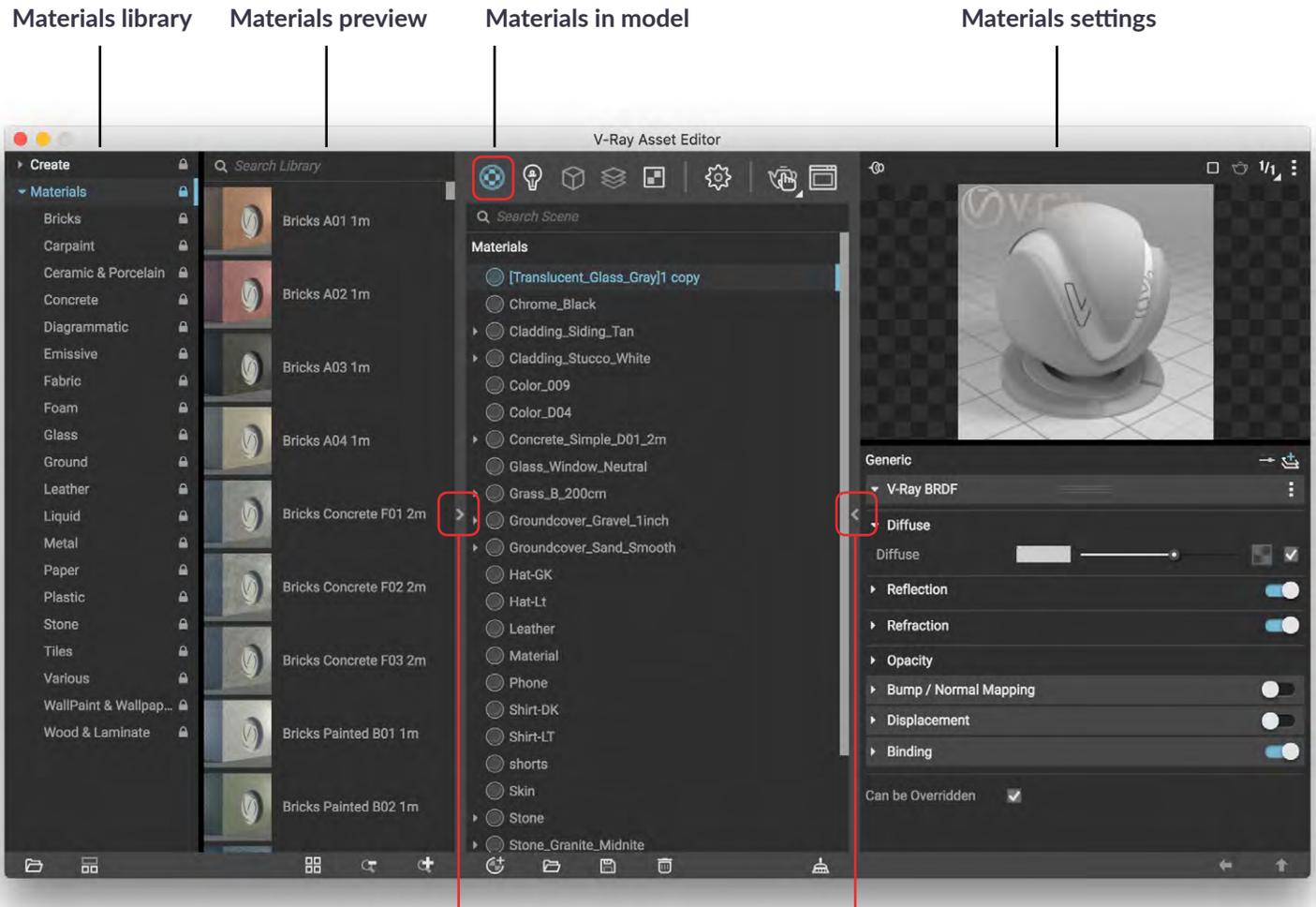
You can toggle back and forth between viewport and Frame Buffer rendering during render by clicking on either.





## 2. Materials

# Materials Overview



← Expand left window for default materials library

Expand right window for material editing options →

## Materials

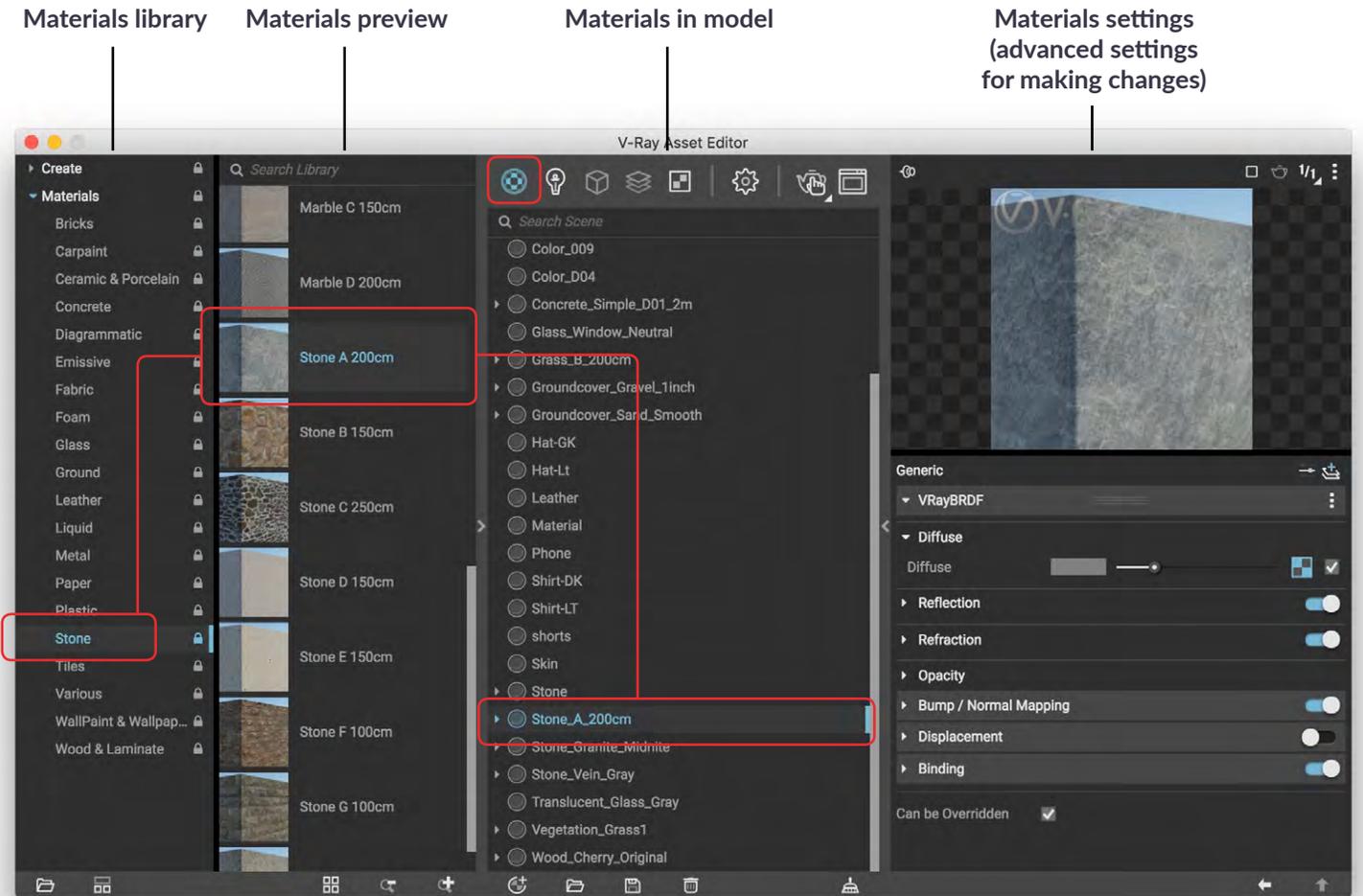
Materials are a good place to start since they have the single biggest impact on making a model go from looking flat and static, to rich and realistic.

V-Ray materials include settings additional settings that aren't available in SketchUp alone. For example, diffuse (base texture), bump (illusion of 3D depth), displacement (actual surface depth), reflection and refraction (deflected light passing through opaque objects), emission (or emissive meaning emits light), etc.

When working together, these maps and settings combine to form any number of realistic real-world materials.

V-Ray includes a great default library of materials to get started with. You can also import materials downloaded from elsewhere, edit SketchUp materials, or create materials from scratch.

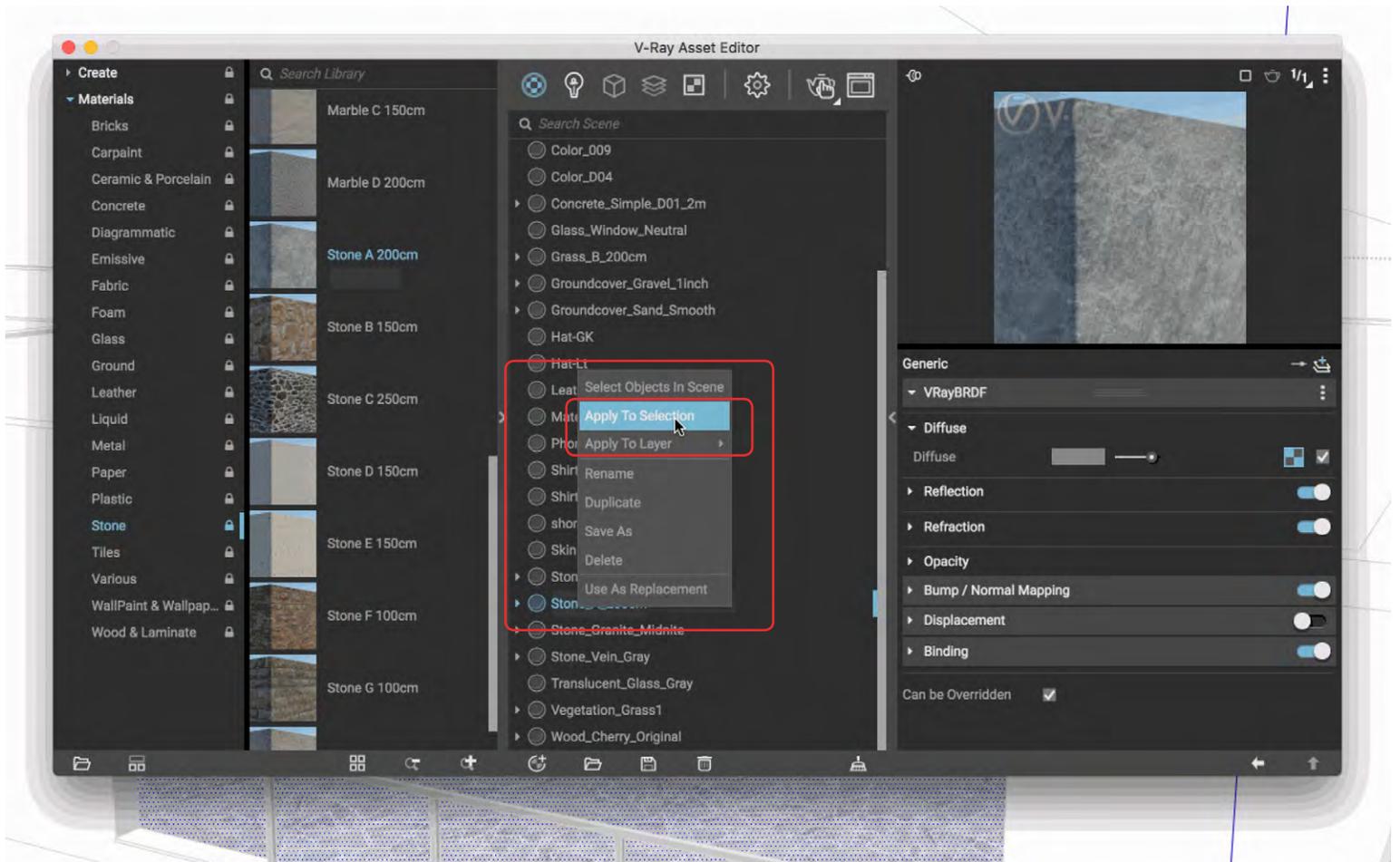
# Applying Materials



## Selecting default materials

To apply a material, first find the material you want from the specific category in the materials library (left). Then drag and drop it into the model materials area (center).

# Applying Materials Cont...

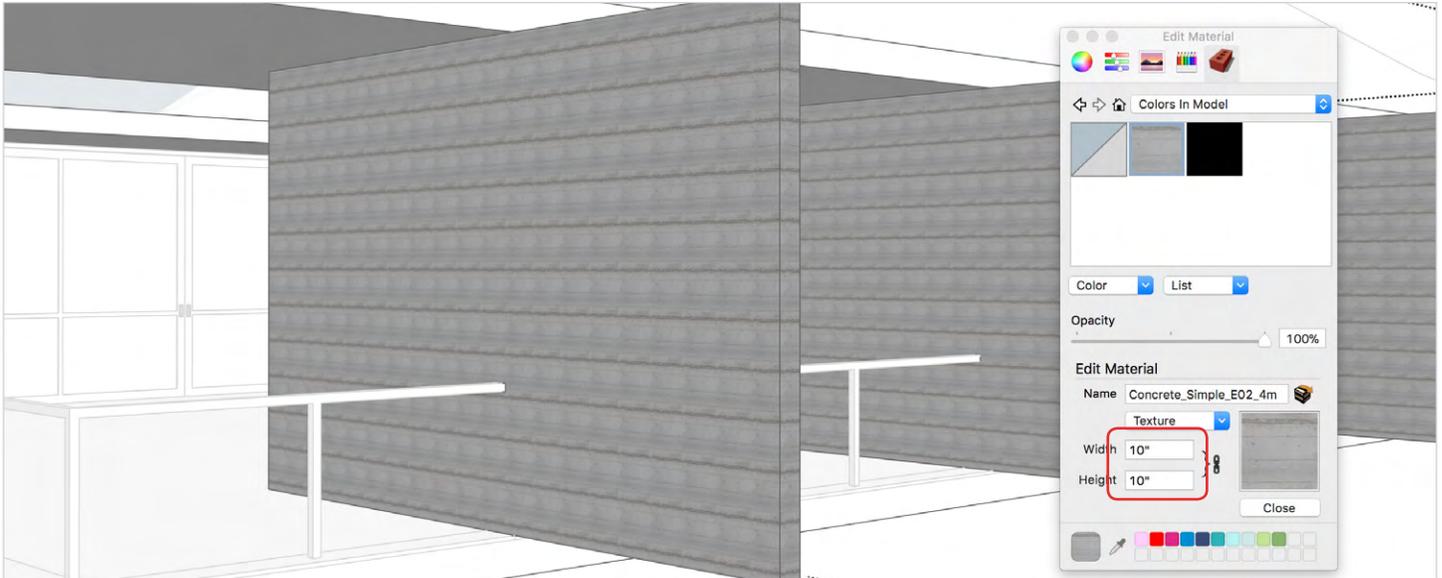


## Applying materials

Then either right click the material and apply it to an entire layer (say window glazing if all your glass has been assigned its own layer) or to selection in the model.

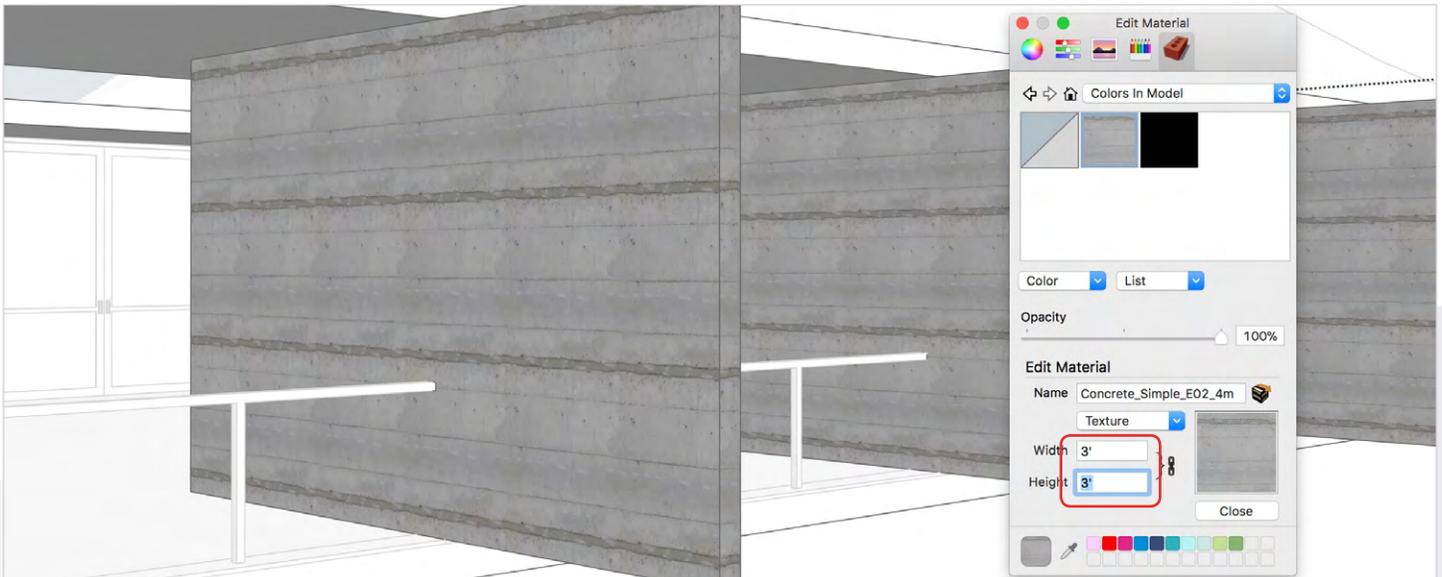
Alternatively, if using selection method, first select the group(s), component(s), or geometry in SketchUp that you want your material to be applied to. Then choose 'apply to selection' in VRAY. The nice thing about this method is that if you have a group or component with nested geometry, it will apply the material to everything within that group or component at once.

## Scaling / Resizing Materials



### Default scale

Materials with a texture, or diffuse map, will also have a scale associated with it. These are in metric units by default (Chaos Group is from Bulgaria by the way) and therefore come in smaller than reality.



### Edited (correct) scale

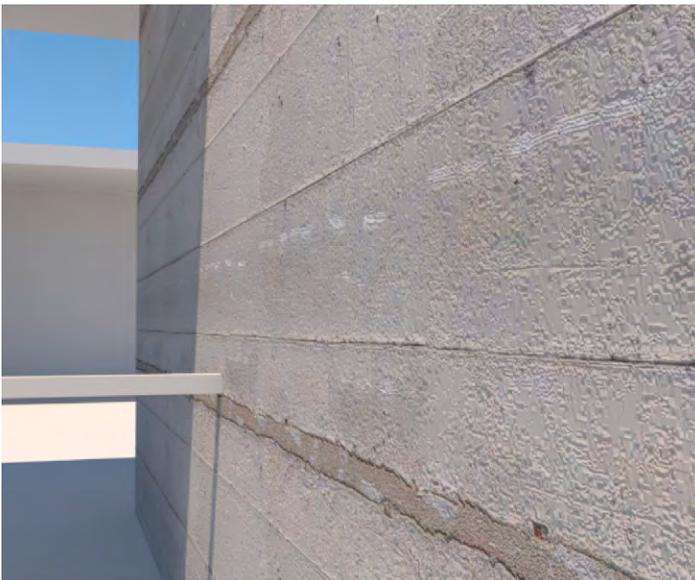
Just edit the material (like any other material) in SketchUp, setting the right size for the material. All associated maps (bump, etc) will update automatically.

# Material Render Preview



## Render test

It's a good idea to do a quick interactive render to see that the material has been applied and renders correctly before spending too much time applying a lot of materials.



## Material detail

The default concrete texture has maps applied already and as you can see react differently to different light / shadow settings.

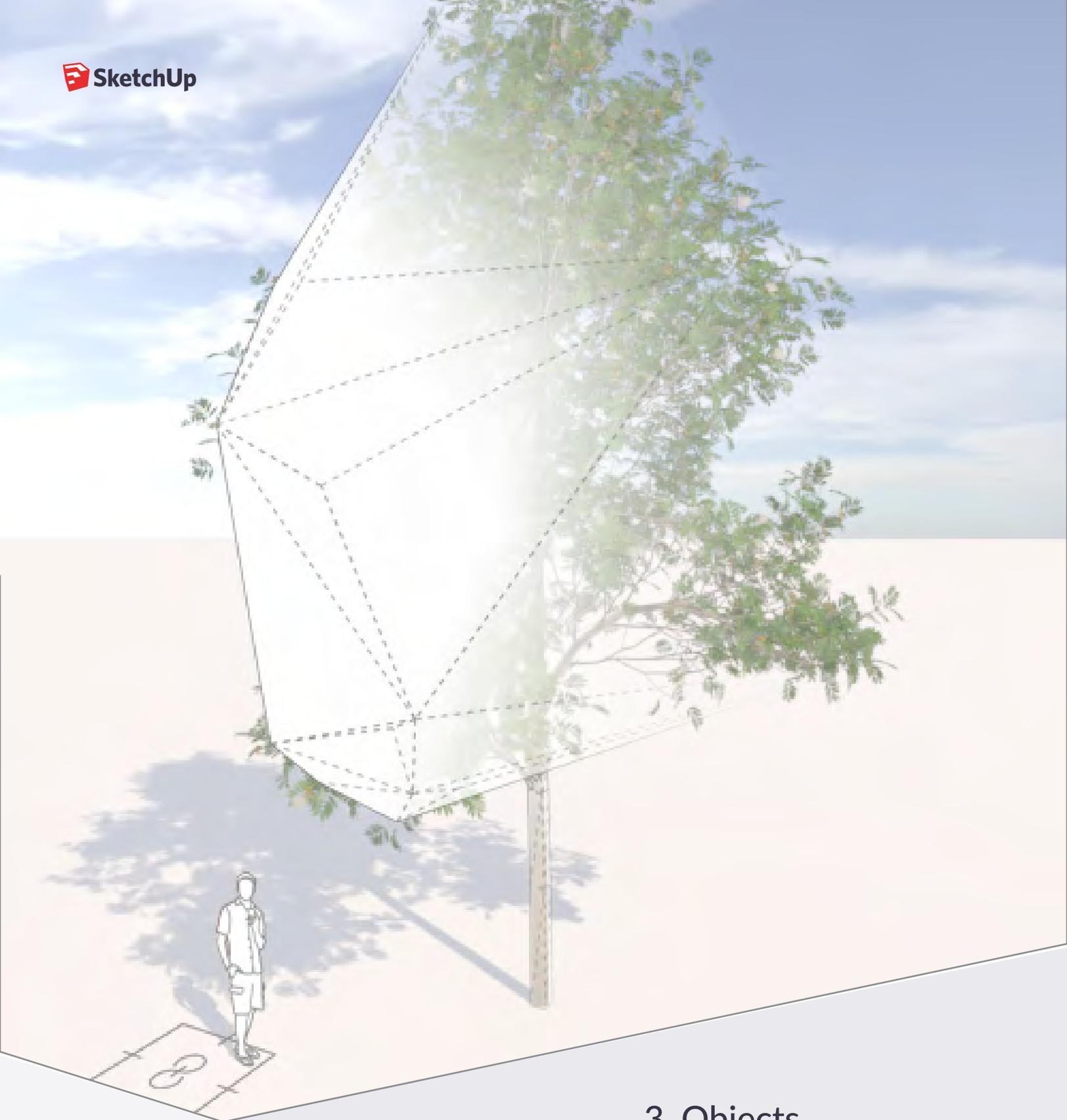
# Materials Exercise



## Exercise

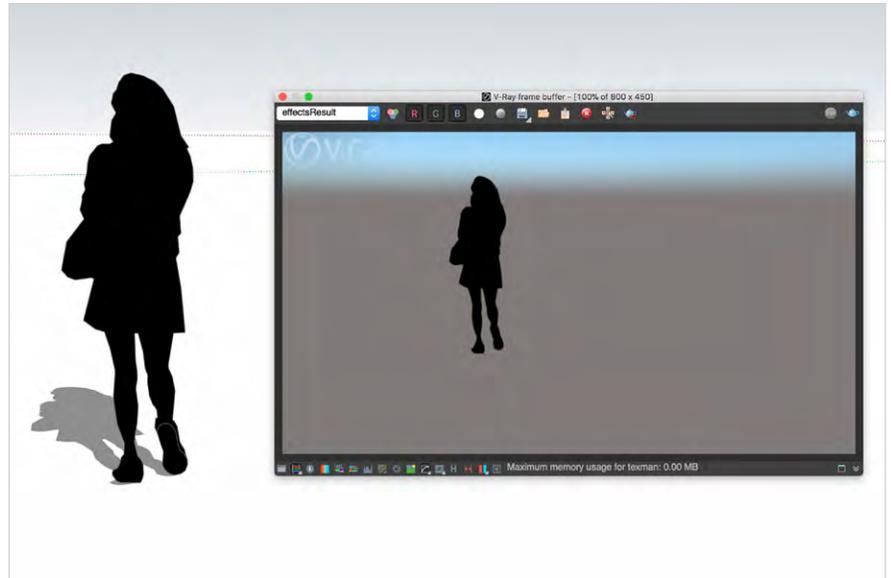
Download or make a simple model. Copy it and apply a variety of materials to each.

\*Be sure to re-scale any materials that have a texture (diffuse map) associated with them. For this example, the Ocean Waves and Grass materials were re-scaled.



### 3. Objects

# Objects - Infinite Plane



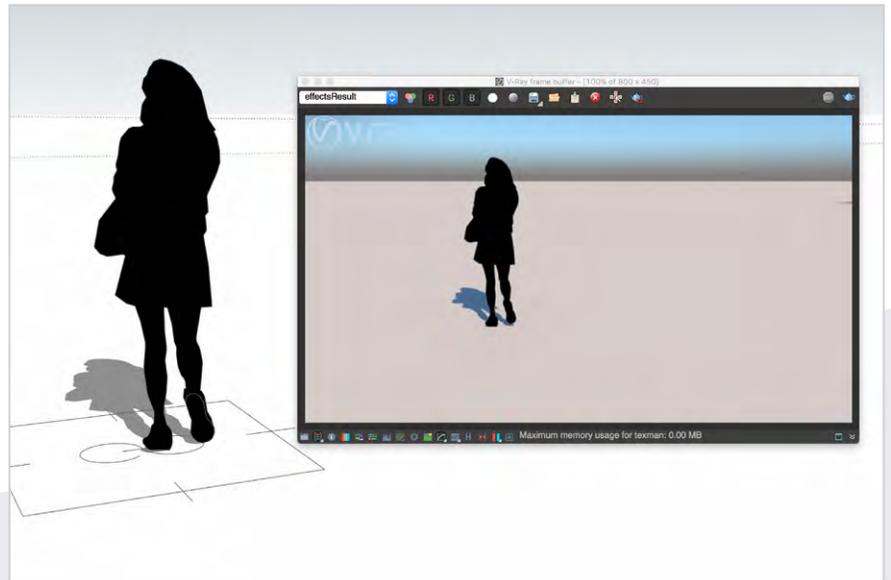
**Without Infinite Plane (Default)**

By default, VRAY does not render a ground plane. If render saved as / PNG, background is transparent. You can add a ground in yourself using SketchUp geometry or use the Infinite Plane in the Objects toolbar.



**Infinite Plane with Material Added**

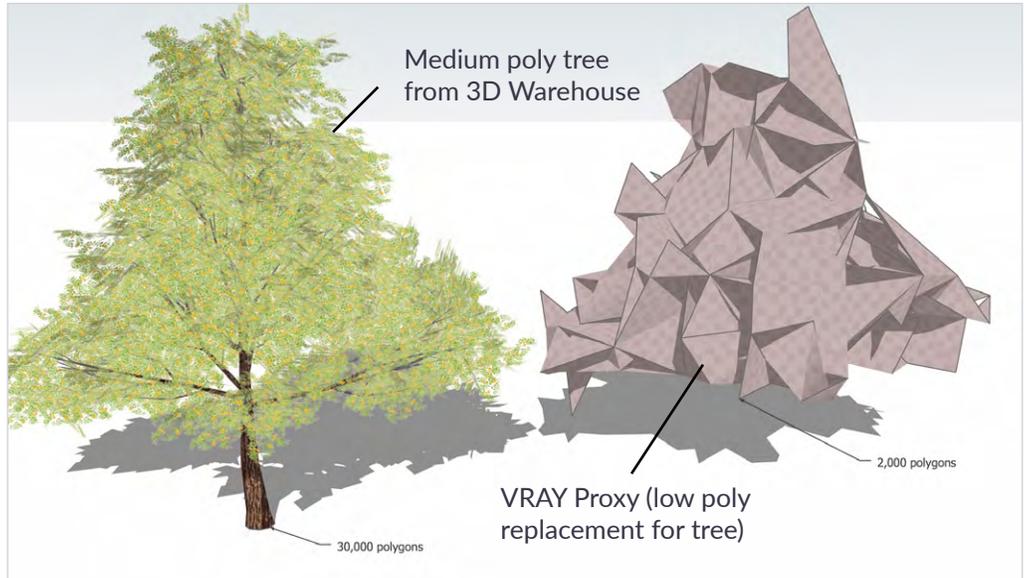
Example: Waves material was added to create fast and realistic "infinite" ocean scene.



**With Infinite Plane**

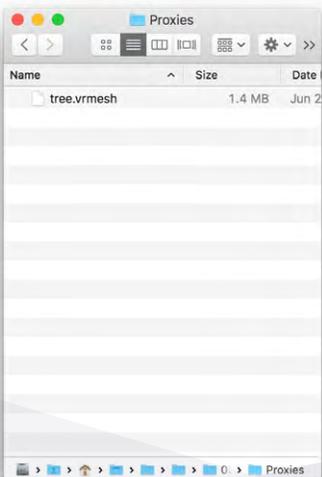
The infinite plane extends to the horizon and receives shadows. By default, it is white but you can add any color or material to it to extend your model's ground plane.

# Objects - Proxies



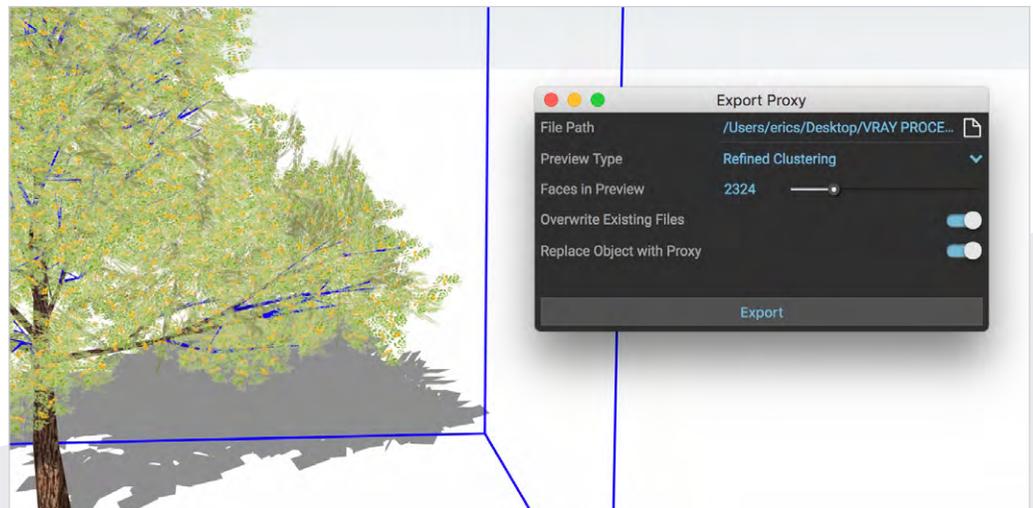
## What are proxy objects?

Proxies are placeholders. They save the geometry and textures to a combined external file and replace them with a simplified version of your object. Then, at render time, the original file, etc is loaded...thus keeping your model light and nimble at all times. Proxies are used more often for things like vegetation that tend to have high polygon counts but can be created for anything in your model that you either a: have really high poly counts, or b: you have a lot of them placed around your model.



## Proxy File

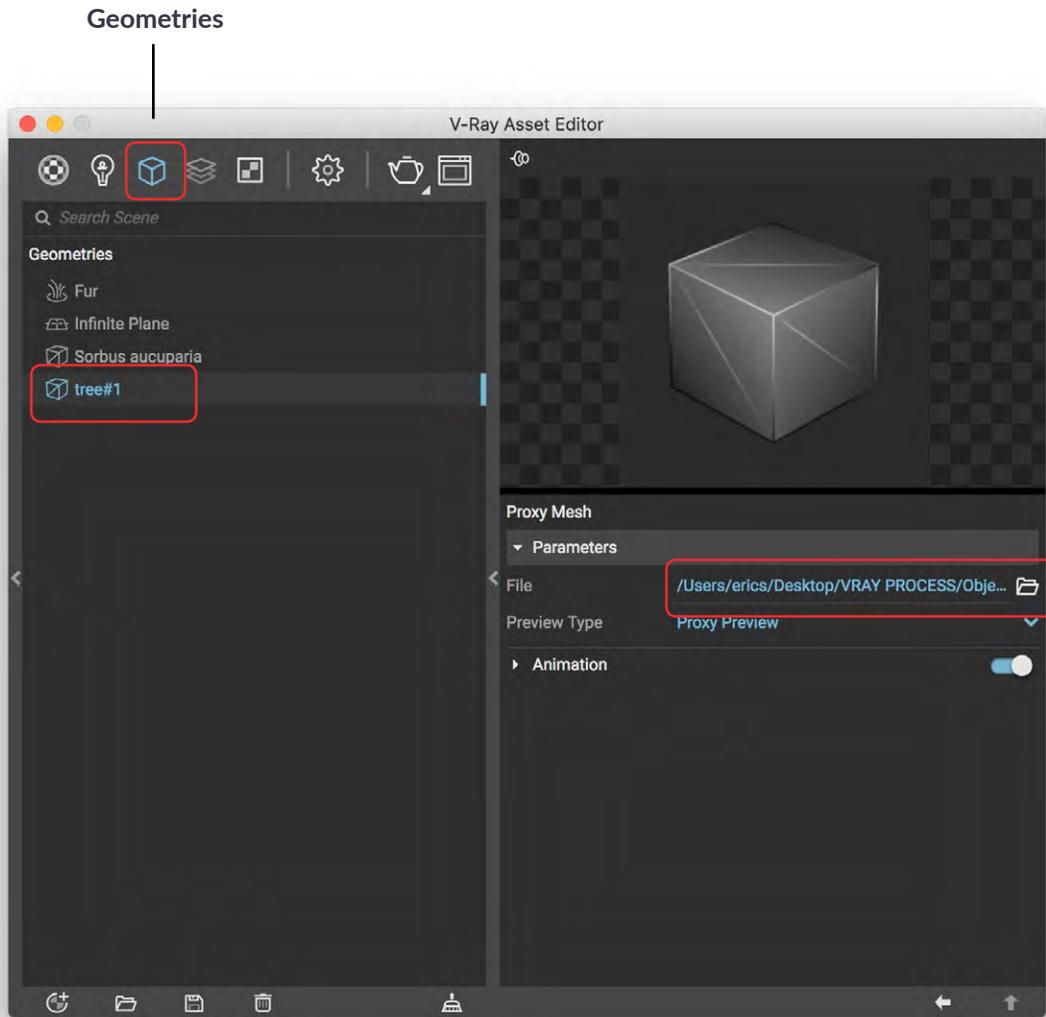
Proxy objects are saved to your hard drive with a '.vrmesh' extension.



## Creating proxies

First select the object you want to turn into a proxy, then click the 'Export Proxy' icon in the Objects toolbar and you're prompted with some settings to refine, including destination for the .vrmesh file to be stored, the number of faces in your "placeholder" and whether or not you want to replace the current selected object in your model or not.

# Objects - Proxies

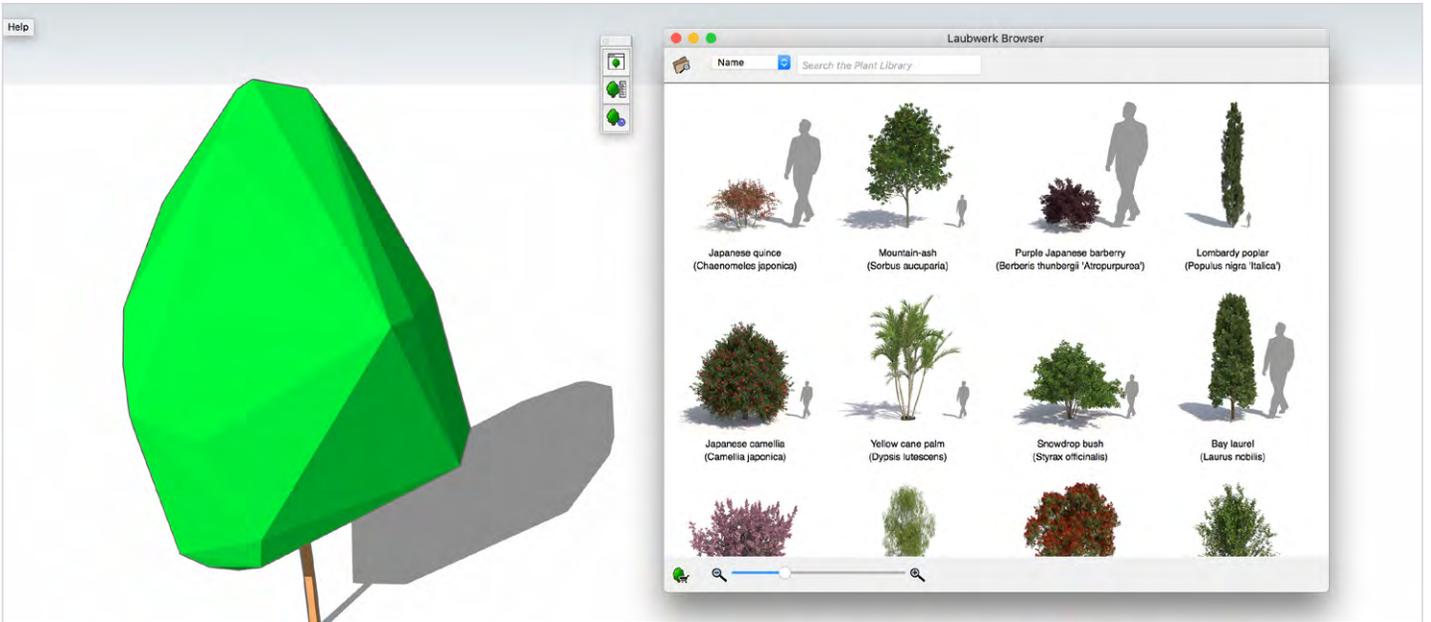


## Object (Geometries) Window

The proxies in your model are shown in the Geometries tab. If you select a proxy, it will show to the right it's file path to where it is saved on your drive.

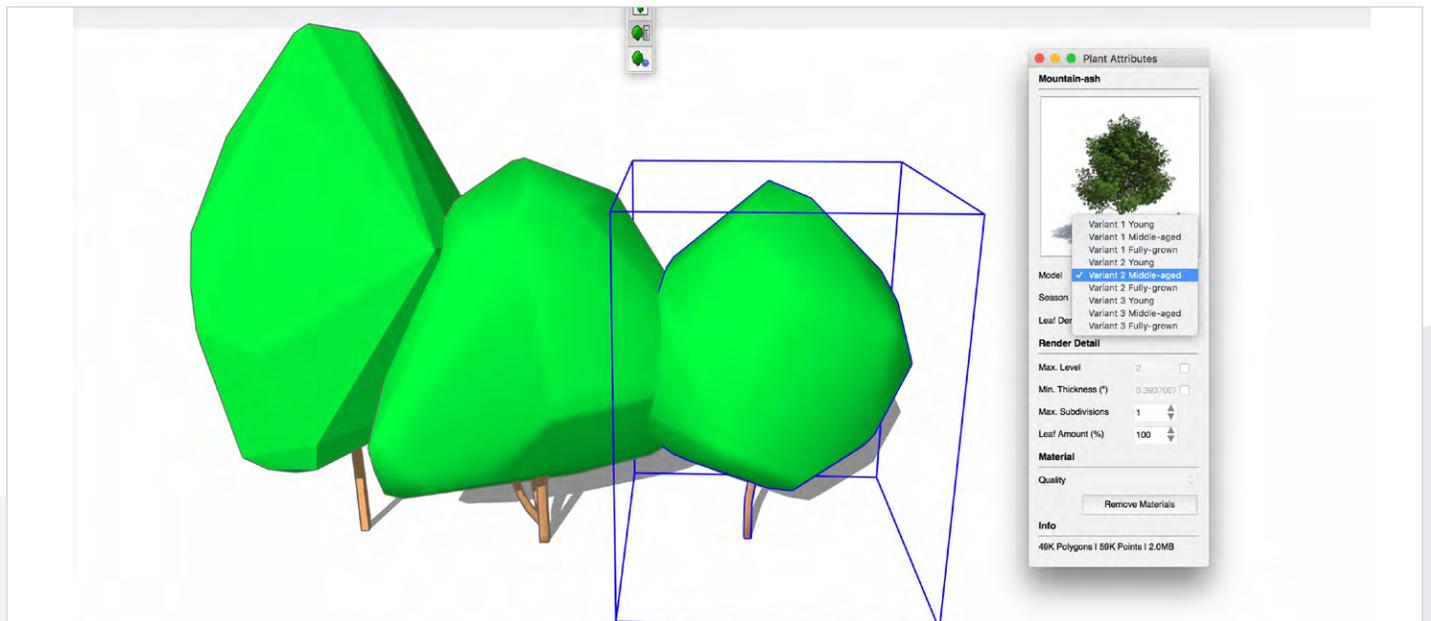
\*Keep in mind that this path has to stay the same for it to load properly. If you move or rename your proxy file or location folder, you will have to re-path it here for it to render properly.

# Objects - Proxies - Laubwerk



## Laubwerk library

Some companies, Like Laubwerk, have identified the need to simplify and expedite the proxy creation, selection and import process and therefore have developed a plugin that provides quick access to purchased proxy trees.

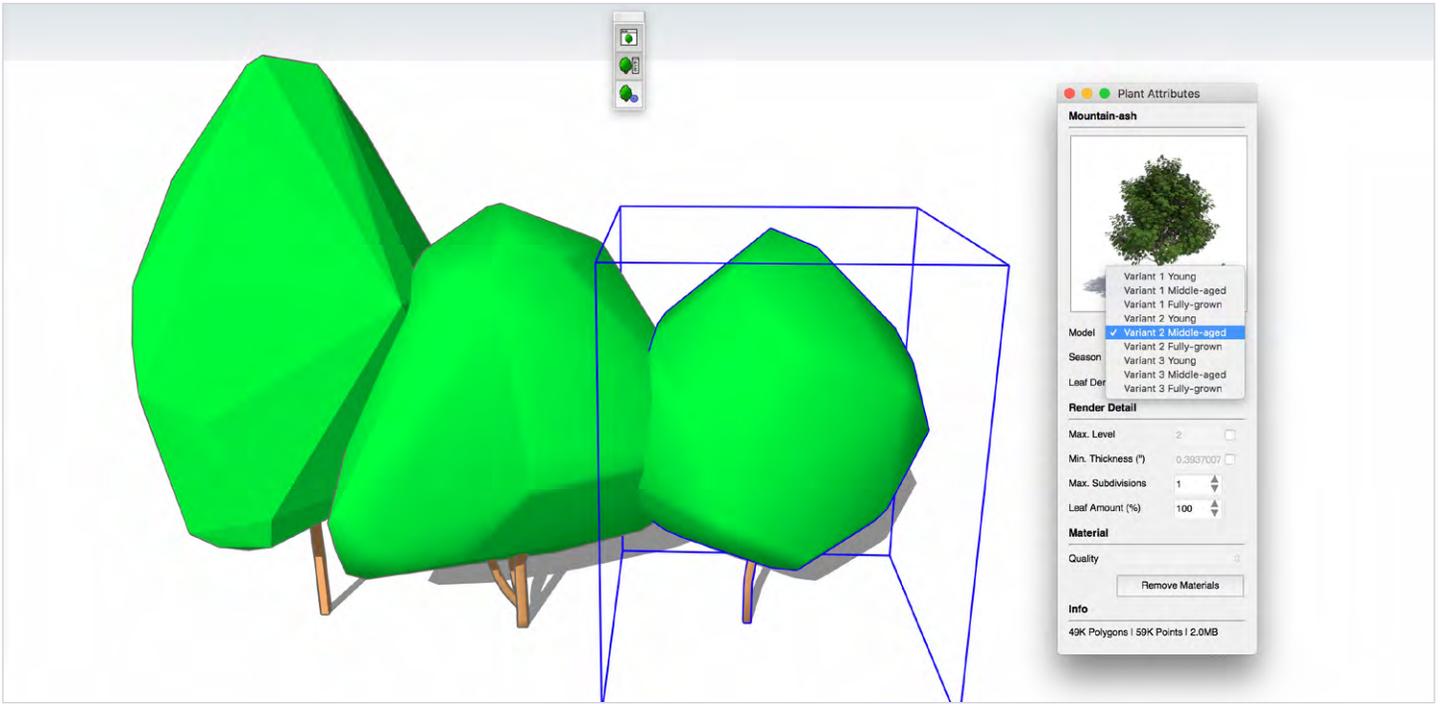


## Laubwerk variety settings

Each plant is actually 36 plants as they have 3 varieties, 3 ages (sizes), and 4 seasons to choose from. Feel free to download the free plugin and free sample plants to test:

<https://www.laubwerk.com/store/plants-kit-freebie/>

# Objects - Proxies - Laubwerk



## Laubwerk proxies in SketchUp

In SketchUp, a low-poly 'preview' component of the trunk and canopy size and shape show in order to help with placement. Like the proxy we created previously, the high resolution geometry and textures will load at render time only.



### Render

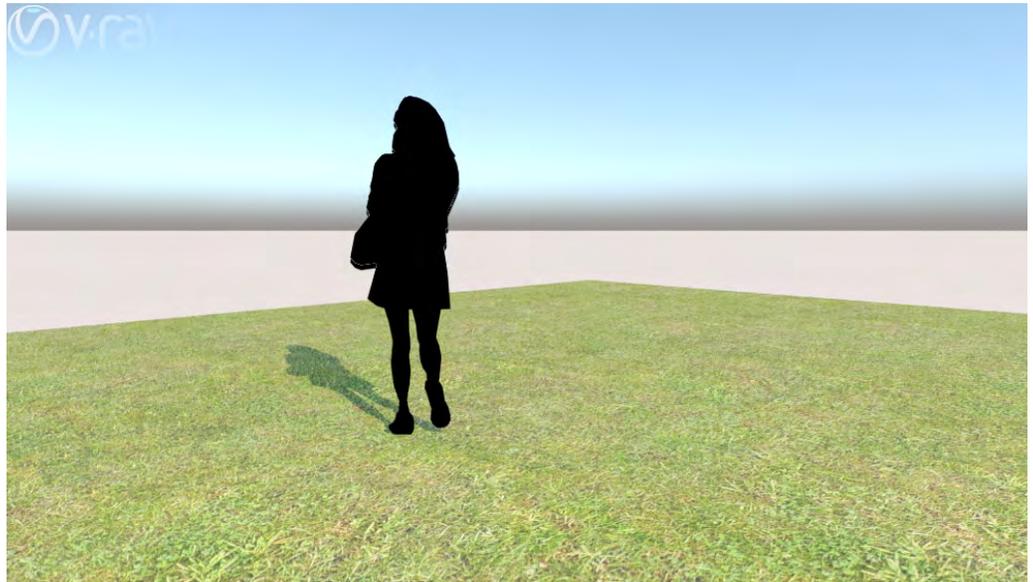
Here is the rendered version of three different varieties of the same tree species shown above.



### Detail

Very high level of detail, including texture maps with little to no impact on SketchUp's performance :)

# Objects - Fur



### What is Fur?

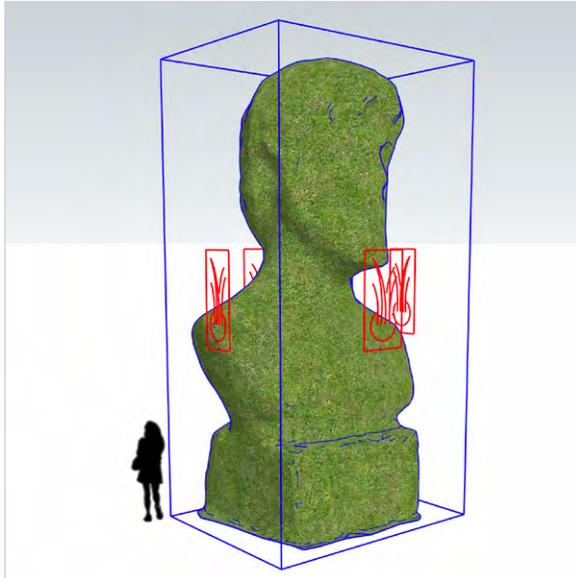
Fur is pretty much what it sounds like. It applies a fur-like layer to a surface or object. This can be used to represent grass, hair, fabric, etc. Like proxies, fur settings can be modified as needed and then sent directly to the render engine at render time. Without fur (above), even a great grass texture with bump maps added can appear flat and unrealistic.



### Fur grass

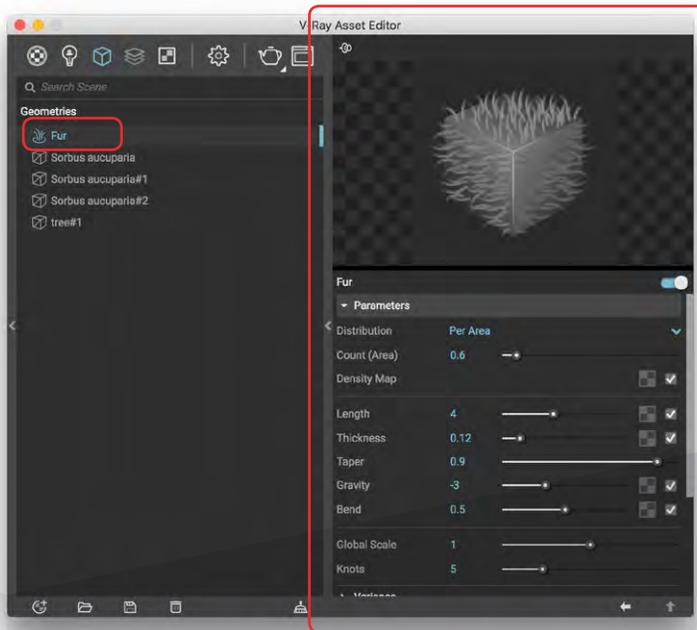
Fur in VRAY picks up the color of the object or material it's being applied to. The variations in grass color and texture from the flat surface below are showing in the 3D grass now projecting out of it.

# Objects - Fur



## Fur bounding box

Groups with Fur applied will now show a new bounding box and icon in SketchUp indicating that the Fur has been applied to it. As you can see here, Fur can be applied to any object group or component.



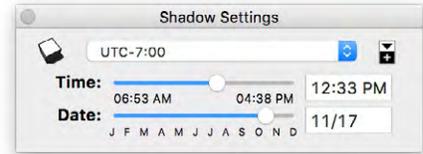
## Fur carpet

A quick tweak of some of the parameters like height, taper, density, etc can easily turn grass into a rug or carpet which gives it an added level of depth and realism that, like the grass example, the flat rug texture alone cannot provide.



## 4. Environment

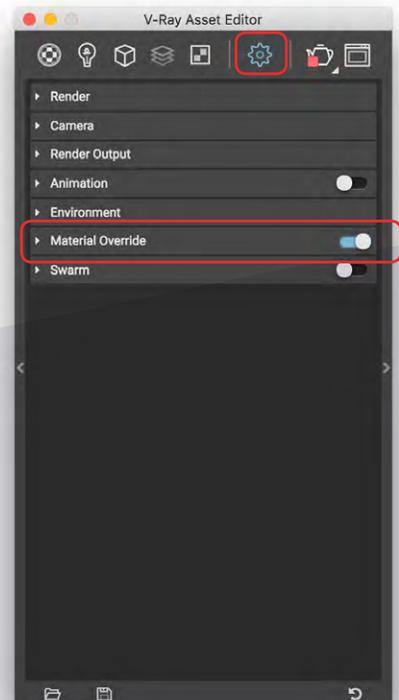
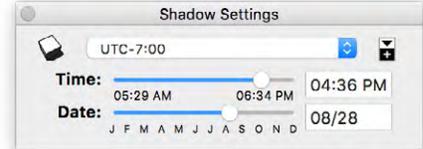
# Environment - Sunlight



For starters, when I say environment, I'm referring to the background environment surrounding your model. This includes background image, environmental lighting, fog, etc.

By default, VRAY uses SketchUp's sun and shadow settings. Changes to the model's time of day or year will show in your render.

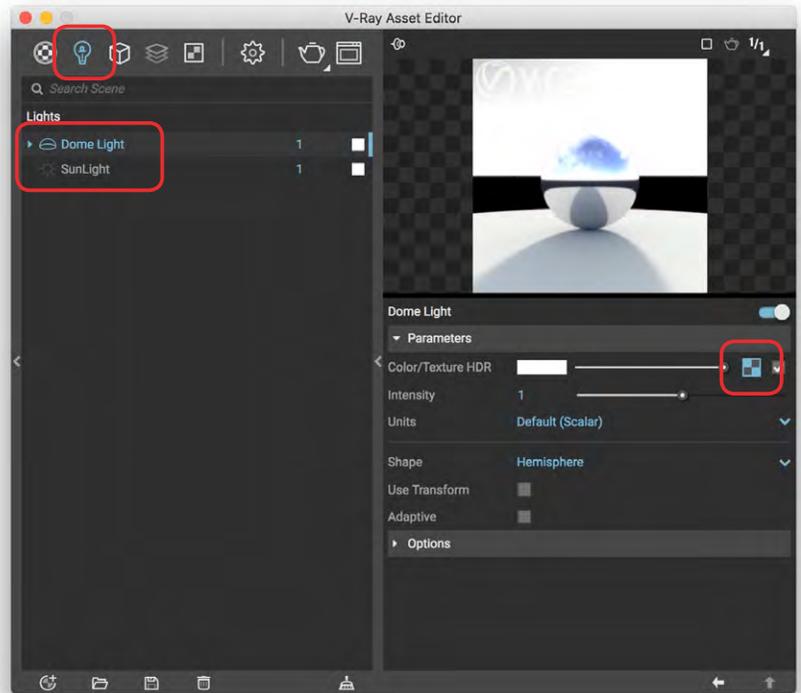
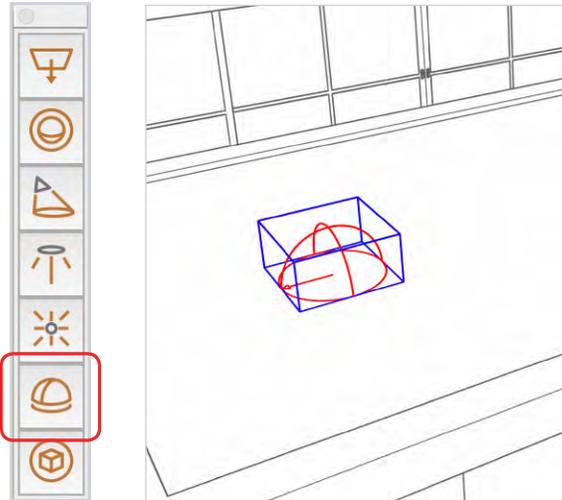
\*Note that SketchUp's fog doesn't show in VRAY. Instead use 'Volumetric Environment' in the Settings tab.



## Light / shade studies

Compare the difference in lighting and shadow quality after adjusting the Shadow Settings sliders in SketchUp. \*Note for this example, I've turned on 'Override Materials' in the Settings tab in the Asset Editor in order to better focus only on the angle / quality of the lighting.

# Environment - Dome Light / HDRI



## Dome Light

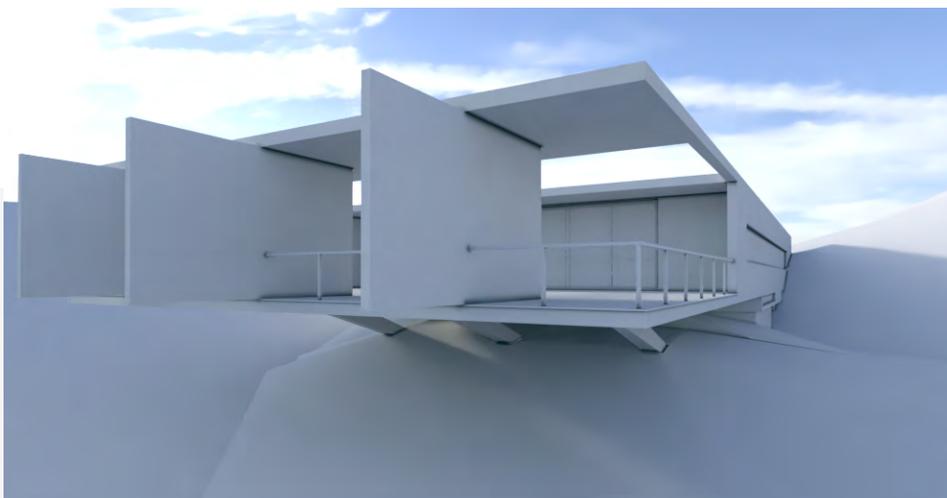
The Dome Light is located in the 'Lighting' toolbar. It is essentially a skybox or skydome that projects a 360 spherical panorama image - called an HDRI (high dynamic range image).

Like the HDR setting on your phone camera, an HDRI has multiple exposures and can simulate environmental lighting conditions, as well as provide the background image for your rendering.

\*Note a big difference to using an Dome Light vs adding a sky in later in Photoshop is that it will show up in reflections ;)

## Dome Light Settings

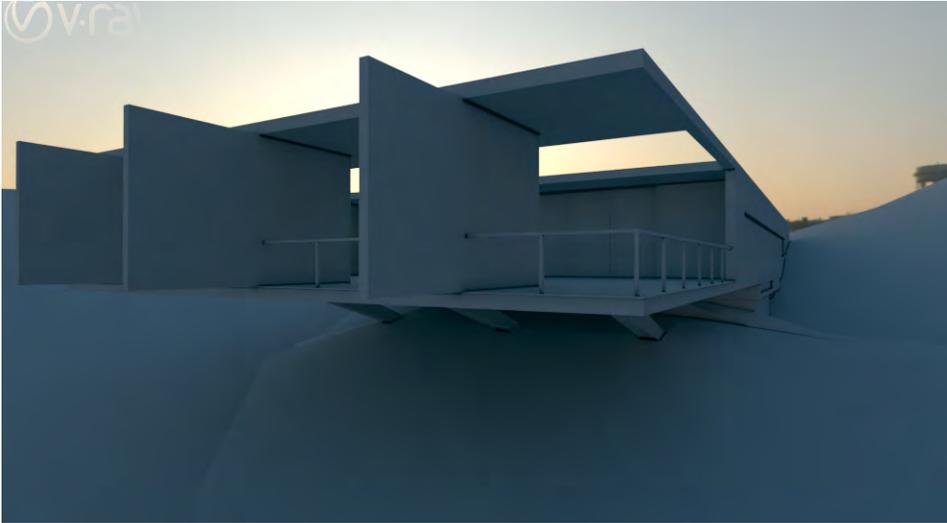
After being added to your model, you can access the Dome Light settings under the 'Lights' tab. You can toggle either the dome light or the default sun on or off here. It is possible to use both at the same time but may produce multiple shadows since there are two sources of sky/sun.



## Default HDRI

There is a default HDRI loaded with the dome light. You can change it by clicking on the color/texture icon (circled above) and browsing to your own HDRI (.env or .exr) file.

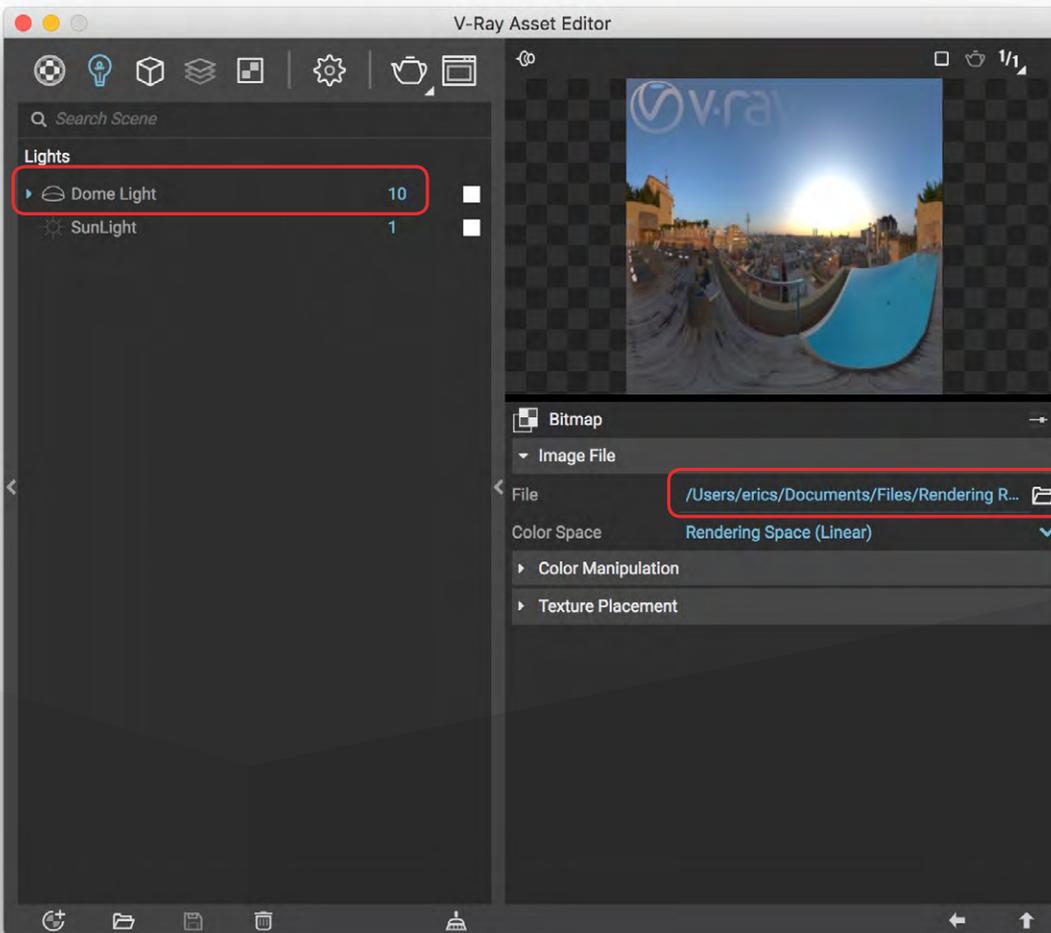
# Environment - Dome Light / HDRI



## External HDRI File

Here I've browsed to an HDRI (.env) file found online and notice the difference in lighting given that this is a dusk shot and therefore darkens the scene as the sun is setting from behind.

You can use get this HDRI [here](#).



## Light intensity

HDRI's have may created from different sources may require adjustment to their intensity to get them to show correctly. Usually, by default, they are too dark and need to be brightened. The dusk HDRI shown above and left was adjusted from 1 to 10 in the 'Lights' tab next to the Dome Light.

# Environment - Dome Light / HDRI



**Forest Field - HDRI + Sun**

Compare the light, shadow, reflections, background, etc that each HDRI location/time of day offers.



**Corporate Plaza - HDRI only**

\*Note it is possible to make the HDRI 'Invisible' so that you get it's lighting effects, but not the background in the event you want to use your own later in Post Production.



**Corporate Plaza - HDRI New background**

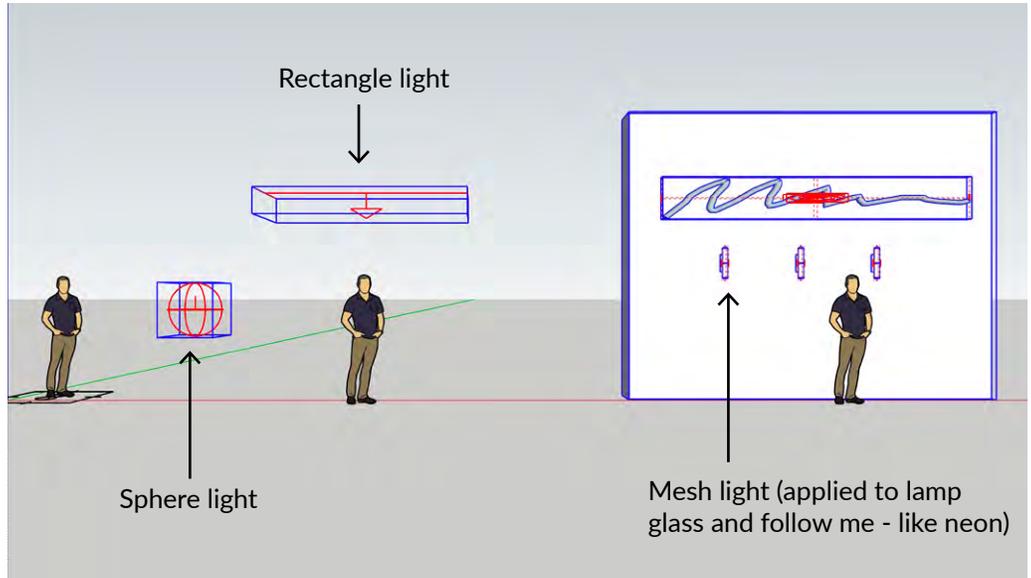
\*Note it is possible to make the HDRI 'Invisible' so that you get it's lighting effects, but not the background in the event you want to use your own image later in Post Production. Beach sunset is much nicer than corporate plaza ;)



## 5. Lighting

# Lighting - Overview

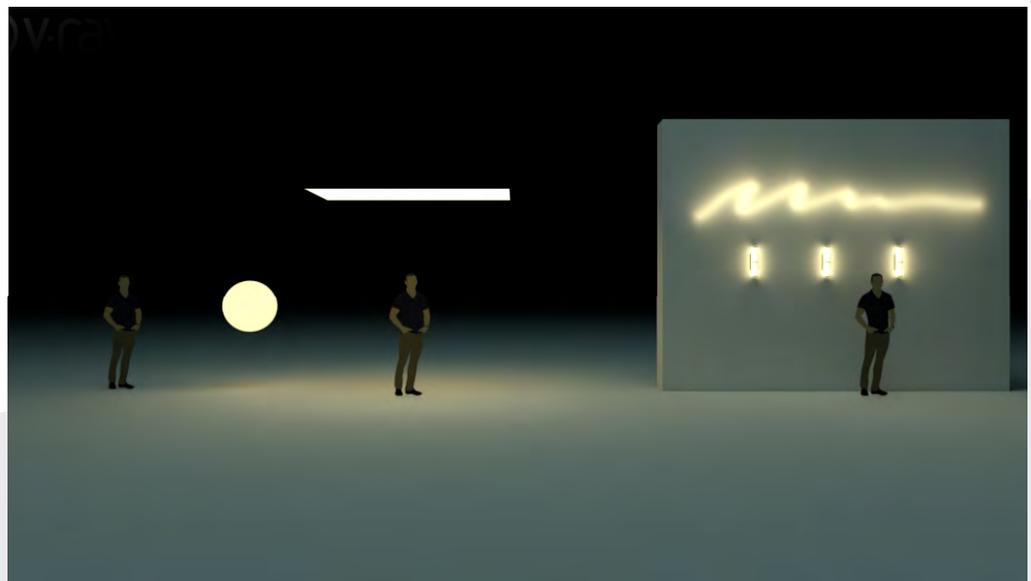
-  — Rectangel light
-  — Sphere light
-  — Spot light
-  — Omni light
-  — IES light
-  — Convert to mesh light



**Sphere light** - Good for general lighting to cast ambient light glow or to function as bulbs inside of lamp housings.

**Rectangle light** - Directional. Good for overhead or studio lighting indoors. Can simulate florescent office lighting or cast even distribution across an area.

**Mesh light** - Good for custom shapes or applying to pre-built components. Any object can become a mesh light by selecting the object first, then choose 'convert to mesh light'.

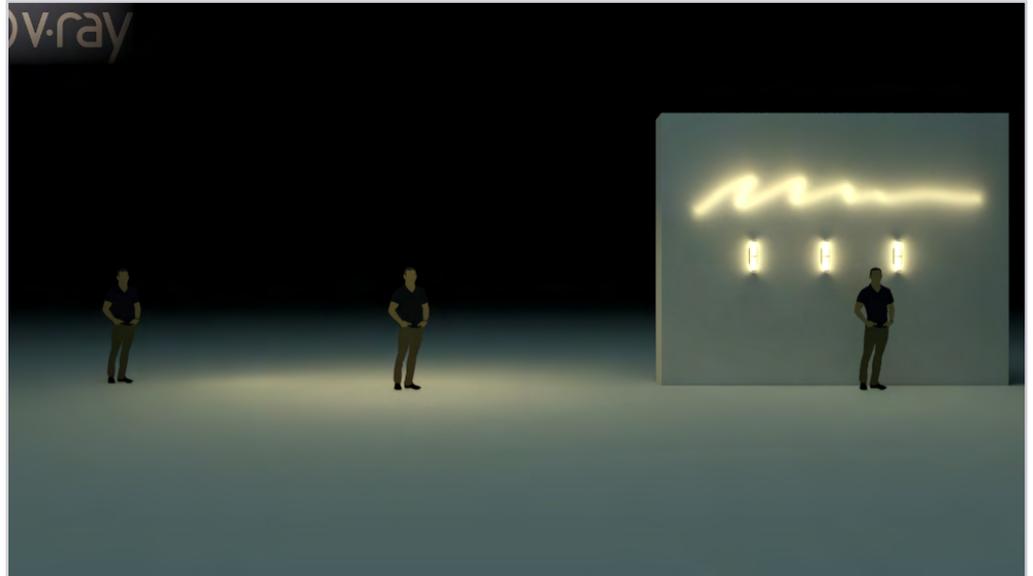


Lights render

By default, the lights themselves are visible. See next page for result when lights set to be 'invisible'.

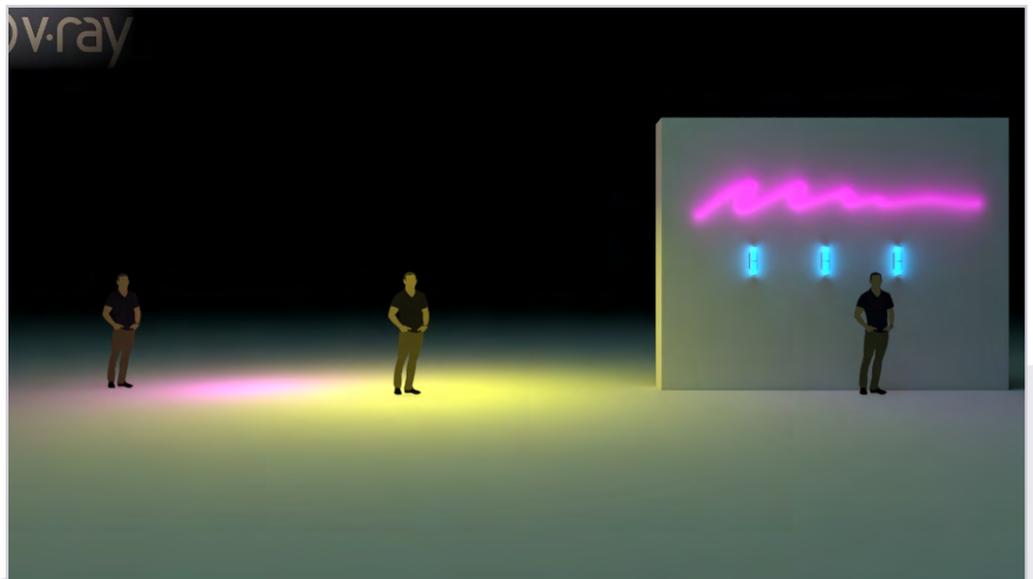
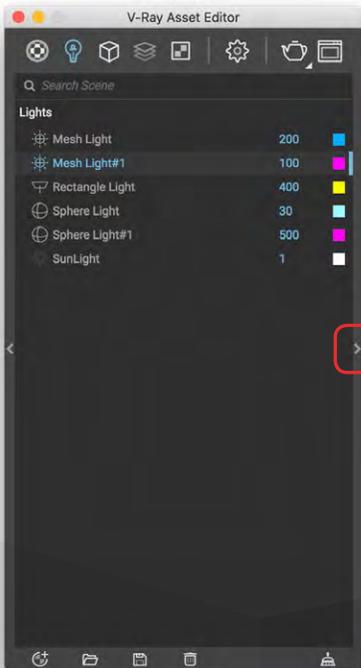
# Lighting - Visibility, Color & Intensity

-  — Rectangel light
-  — Sphere light
-  — Spot light
-  — Omni light
-  — IES light
-  — Convert to mesh light



Visible/invisible light source

Under 'Options' you can toggle the light as visible or not. Different lighting scenarios may call for one or the other.



Color & intensity

Next to each light are quick settings to edit both the intensity (shown as numbers) and color. Exapnd the window to the right for more advanced customization.

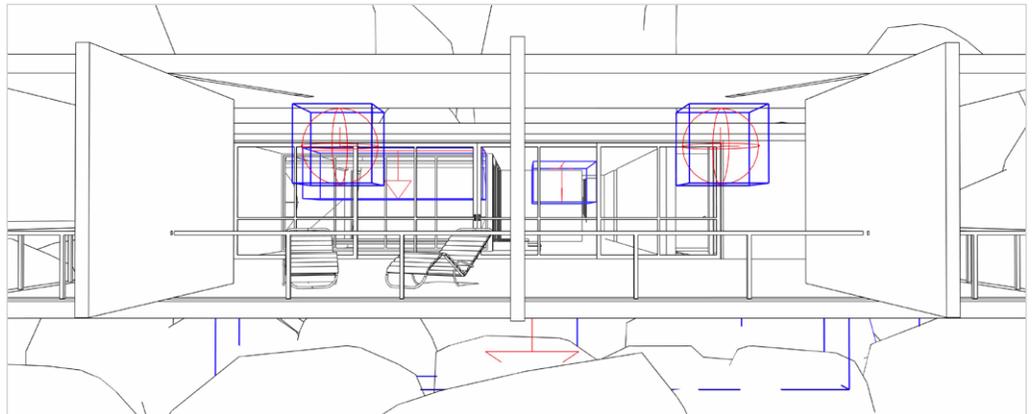
# Lighting

-  — Rectangel light
-  — Sphere light
-  — Spot light
-  — Omni light
-  — IES light
-  — Convert to mesh light



Without lights

While not bad, the house feels unoccupied and a bit sad. And the shrub planting under the deck is lost completely as it sits in shadow.



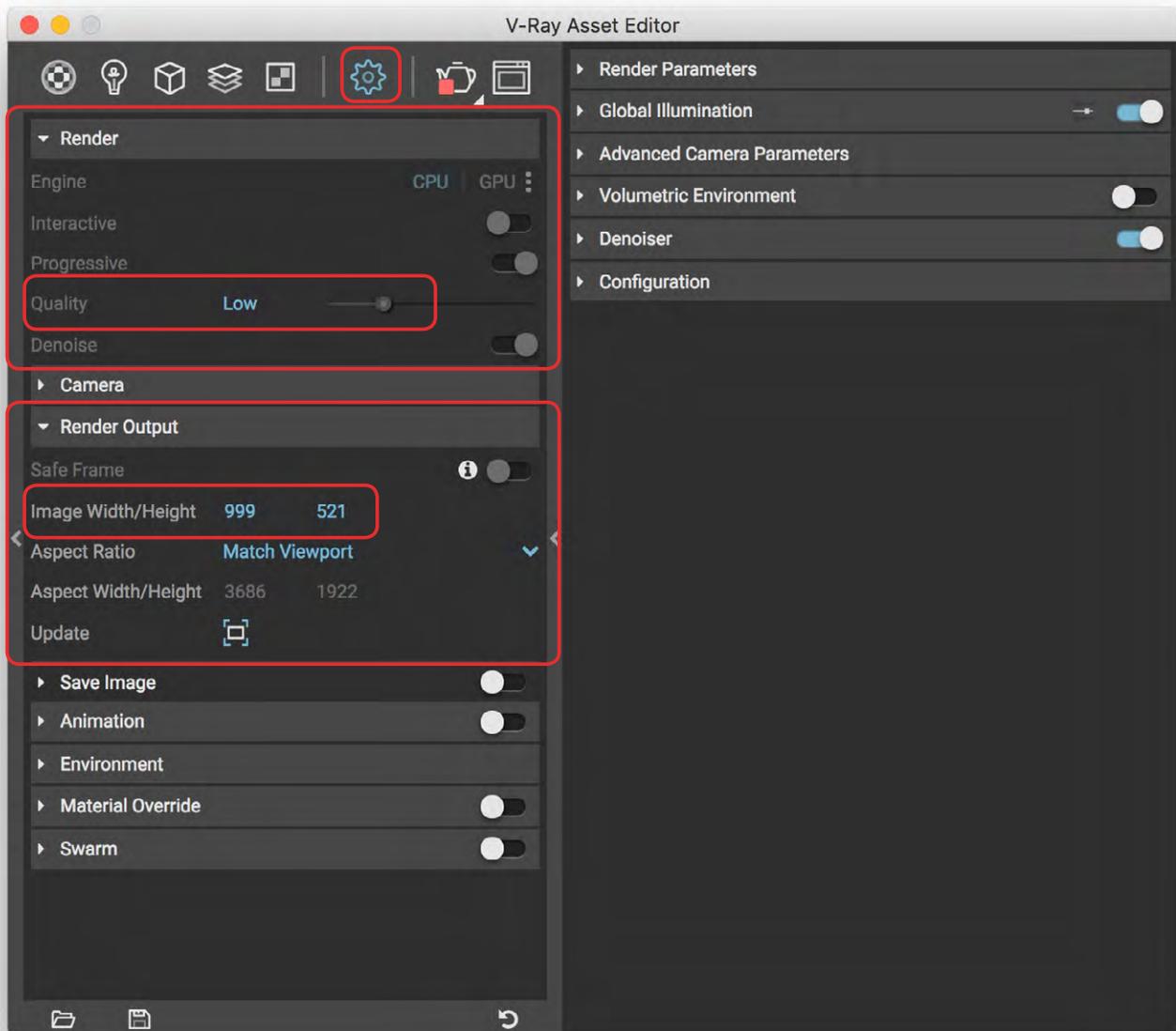
With lights

A few lights placed inside the house (rectangle), on the deck (sphere) and under the deck (rectangle) make a big difference with very little effort.



## 6. Output

# Output - Options



## Output (saving render) options

There are only two areas to focus on in with regards to rendering and saving your final images.

First, is quality which is under the 'Render' dropdown in the 'Settings' tab. Obviously, the higher the quality, the slower the render. Be sure to keep it under medium for testing and then, when ready to do final render, bump up to high or very high as desired.

Second is 'Render Output'. Here is where you can specify the image dimensions. Keep in mind the larger the image size the longer it will take to render as well. Finding the right balance between size and quality will keep things running as efficiently as possible.

Also, make sure to check 'Denoise' or 'Denoiser' as that will help which smooth out the noise artifacts, which are especially apparent at lower quality renderings. It adds minimal time to the render and makes a big difference in overall quality.

## Output Comparison - Quality + Size = Time



1000 px - Low w/ Denoiser - 12.6 sec



1000 px - Very High w/ Denoiser - 1 min 29 sec



2500 px - Low w/out Denoiser - 21 sec (zoomed 150%)



2500 px - High w/ Denoiser - 4 min 10 sec (zoomed 150%)

### Results

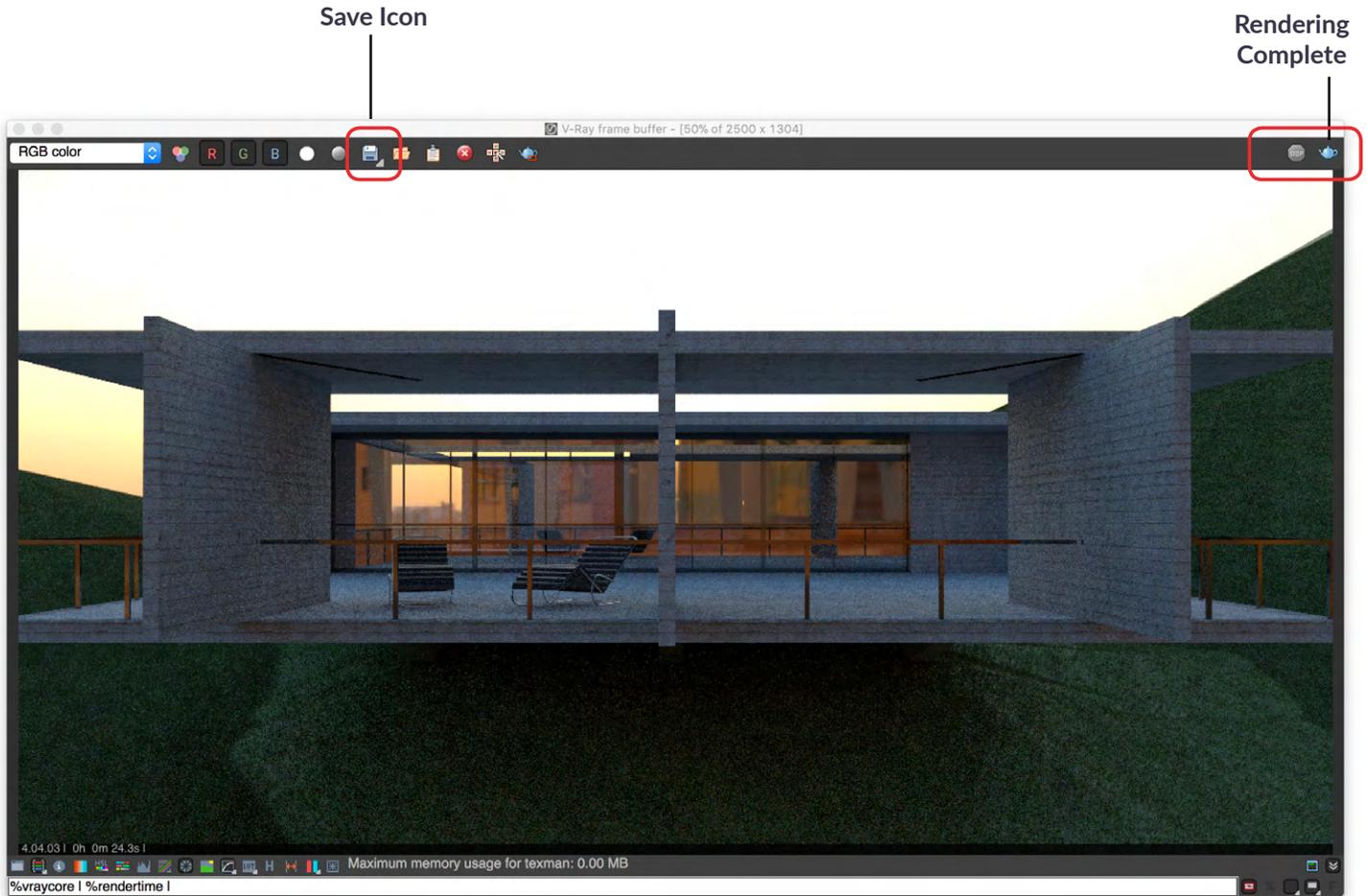
Beyond quality and dimension settings, other things that could add time to your render are lots materials with transparency and reflections, vegetation with lots of small geometry, artificial lights, and elements that add additional detail like grass (either from proxies or VRAY fur).

# Output - Saving

Rendering In Progress



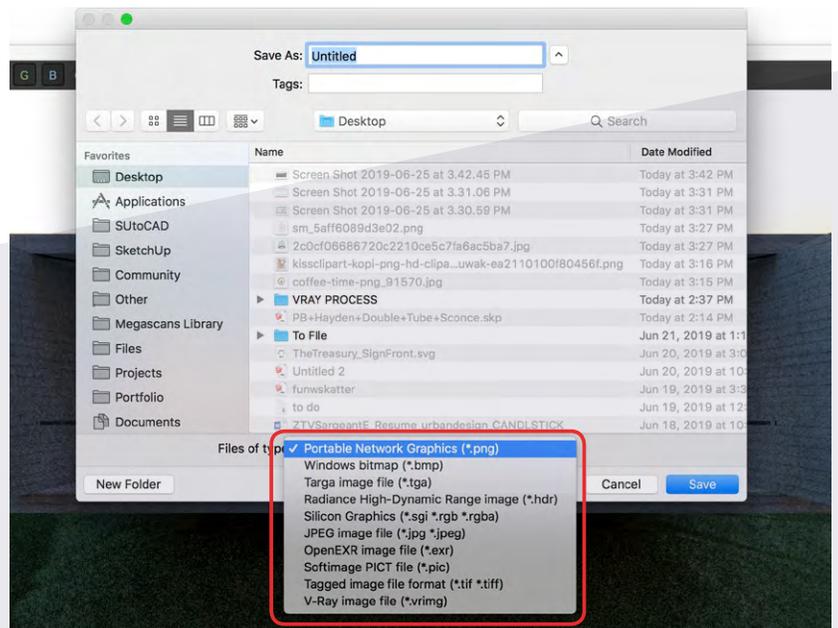
Rendering Complete



## Format Options

After your render completes, to save, click the disk icon (circled above) to choose destination.

For formats, you have several options to choose from. Keep in mind that if you're not using an HDRI background, choosing PNG preserves transparency so you can add your own background images in later using Photoshop.



That's it! Now get out there and create some awesome imagery using the super speed and flexibility of SketchUp combined with the incredible horsepower of VRAY.