DIVA-FOR-RHINO DEMO

Radiance International Workshops 2013

National Renewable Energy Lab

Golden, CO

Kera Lagios

Solemma, LLC

Co-founder and owner

DIVA-for-Rhino

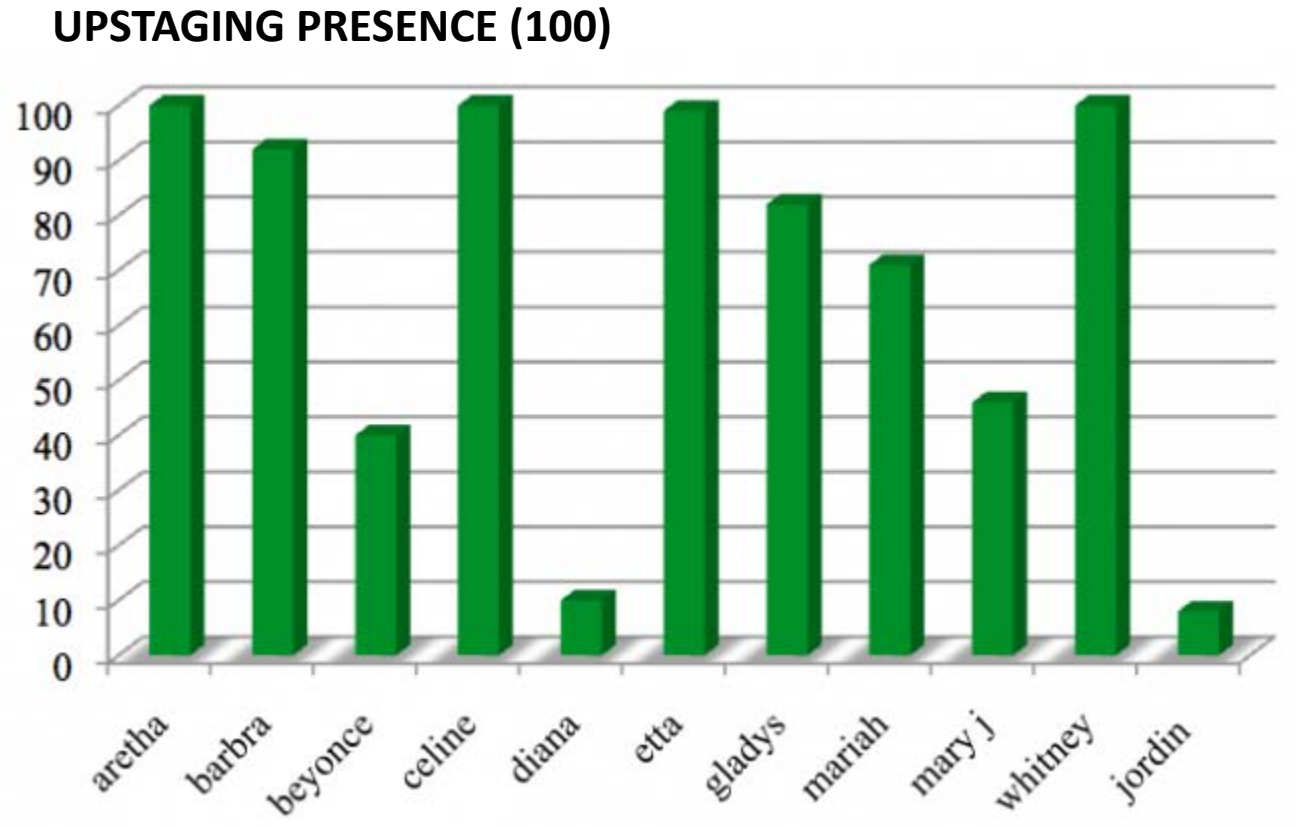
Developer of DIVA-for-Rhino

Lam Partners
ARCHITECTURAL LIGHTING DESIGN

Designer

Who is the greatest DIVA of the last 25 years?

Who is the greatest DIVA of the last 25 years?

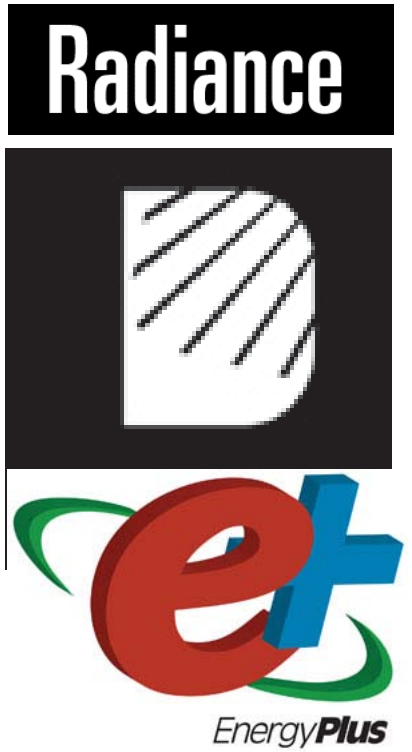


http://www.theawl.com/2010/09/who-is-the-greatest-diva-of-the-last-25-years-we-offer-scientific-proof

R.I.P. 2012

What is DIVA-for-Rhino?

+

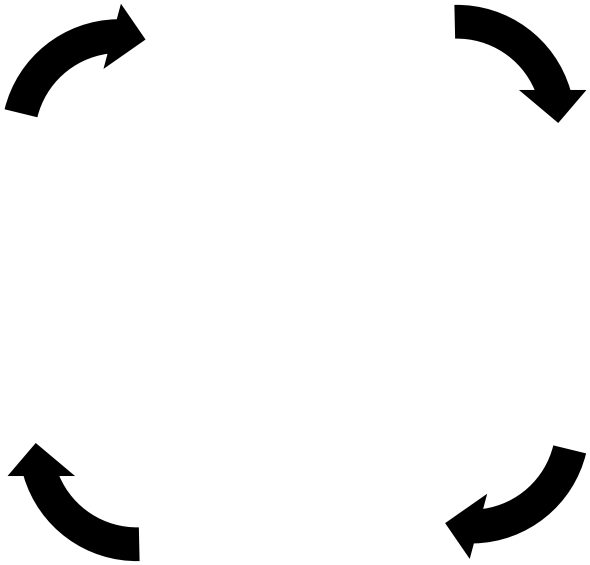


Rhino and Grasshopper

Radiance, Daysim and EnergyPlus

Why DIVA?

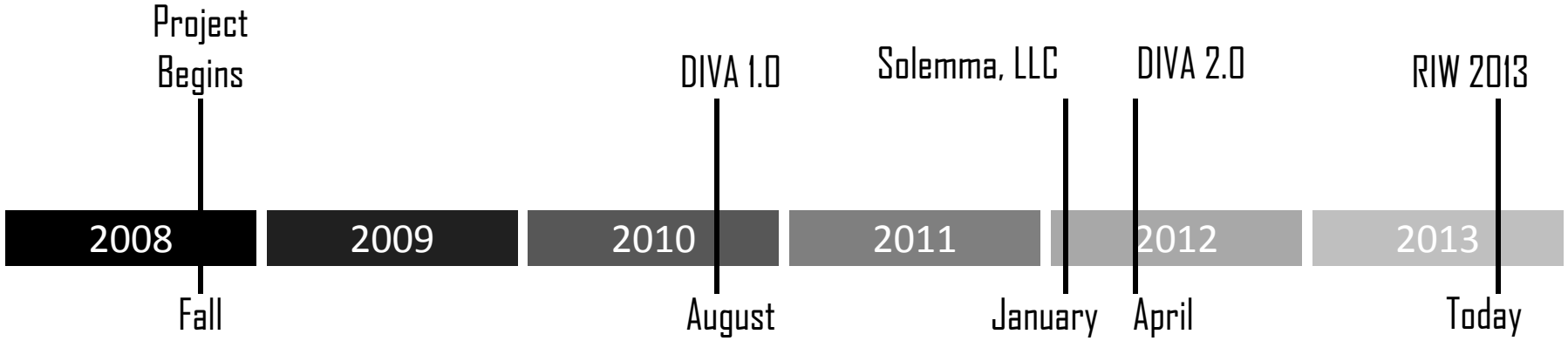
DESIGN
ITERATE
E**V**ALUATE
ADAPT



Solemma is, and DIVA is developed by

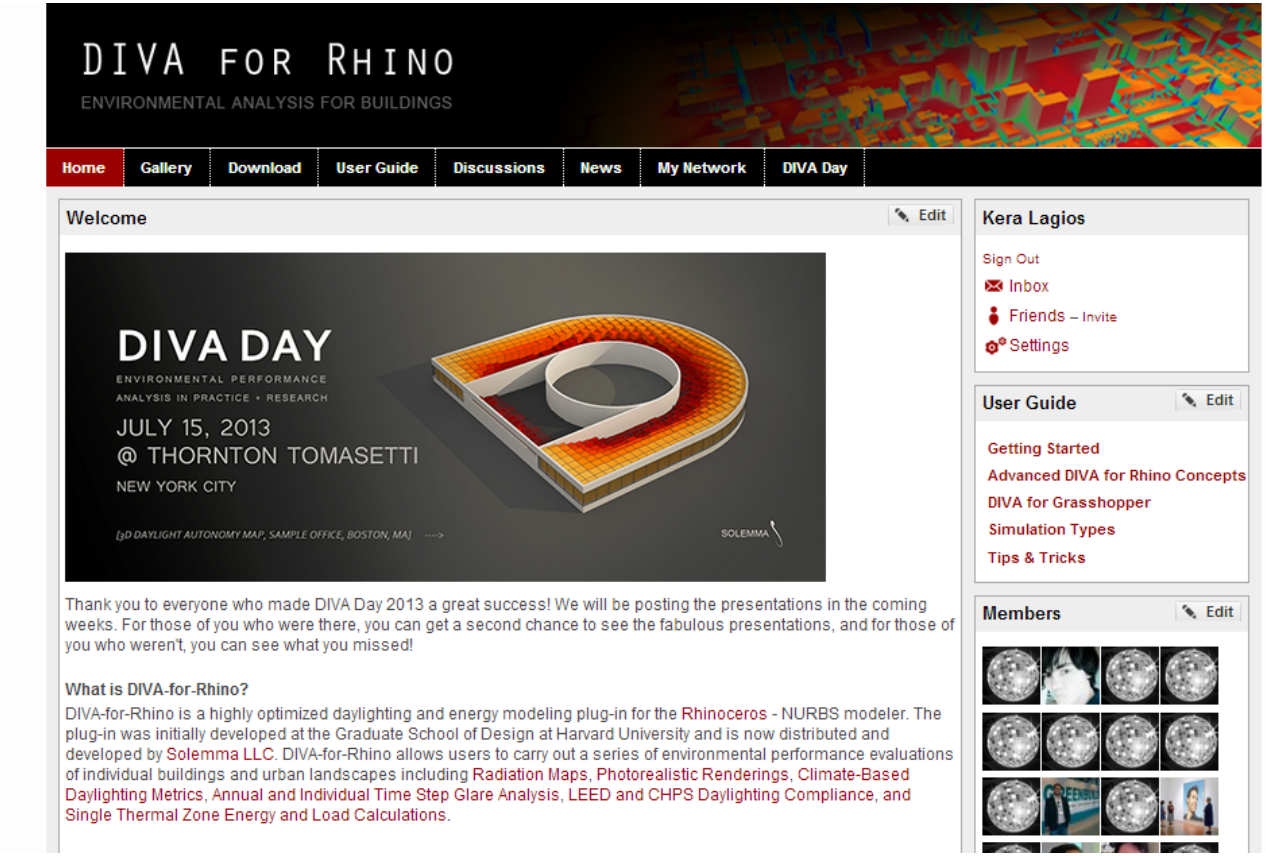
Alstan Jakubiec
Kera Lagios
Jeff Niemasz
Christoph Reinhart
Jon Sargent

Timeline


Project Begins
DIVA 1.0
Solemma, LLC
DIVA 2.0
RIW 2013
2008
2009
2010
2011
2012
2013
Fall
August
January
April
Today

DIVA Day

Tutorials and User Forum



Project History

Rhino/DIVA Platform/Interface

DIVA-for-Rhino Demo

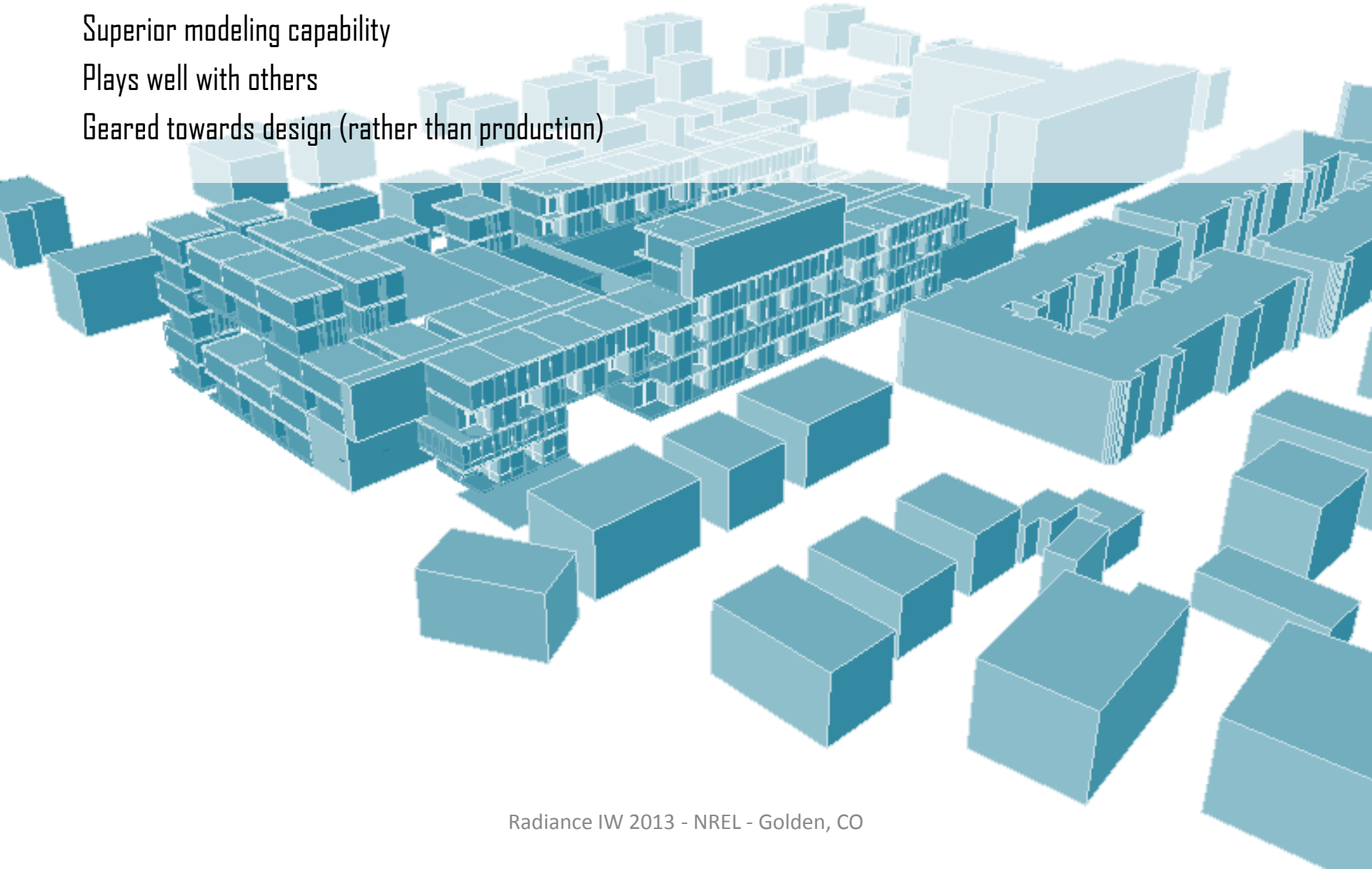
DIVA-for-Grasshopper Demo

Why Rhino?

Superior modeling capability

Plays well with others

Geared towards design (rather than production)

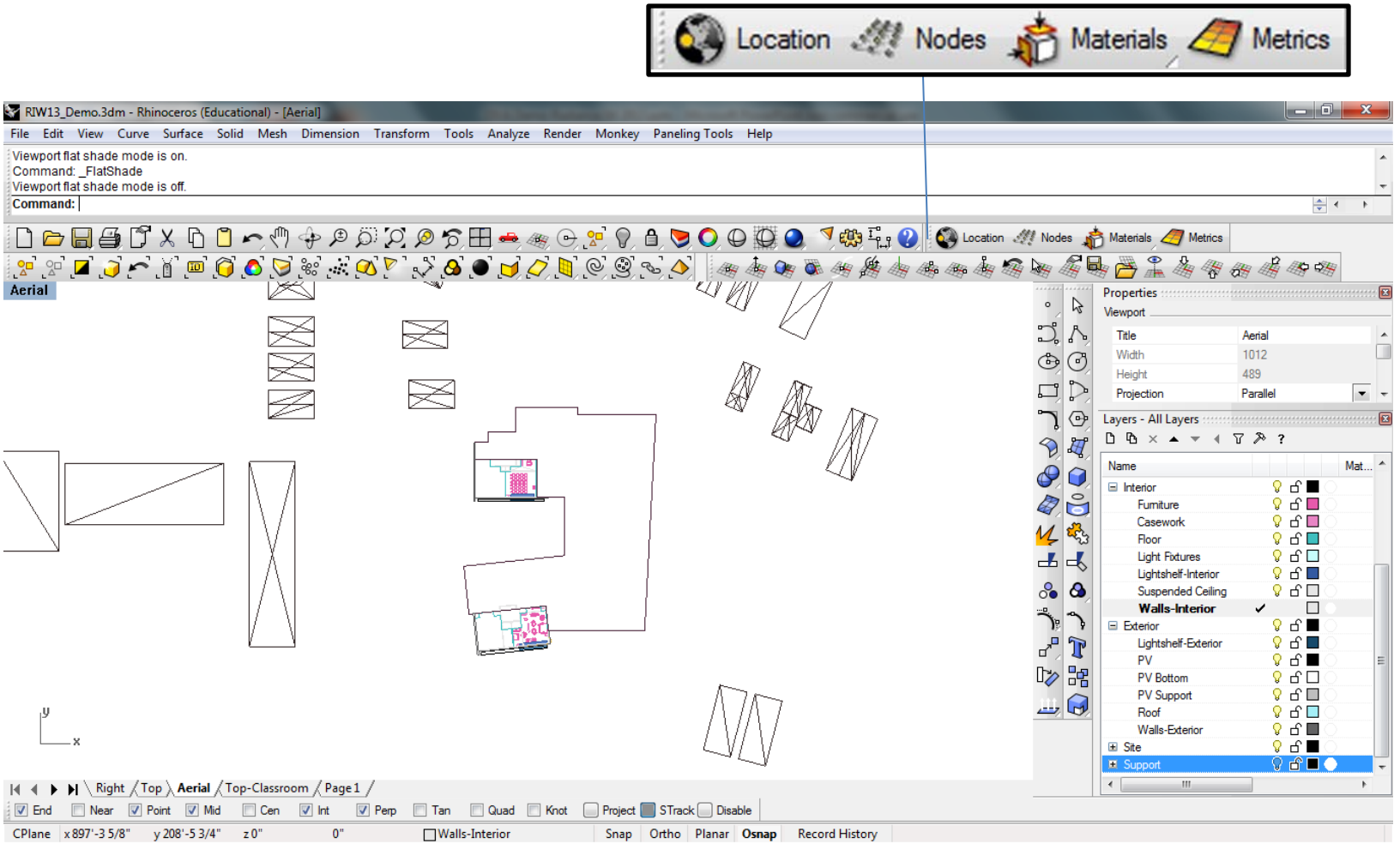


Rhino v. Grasshopper

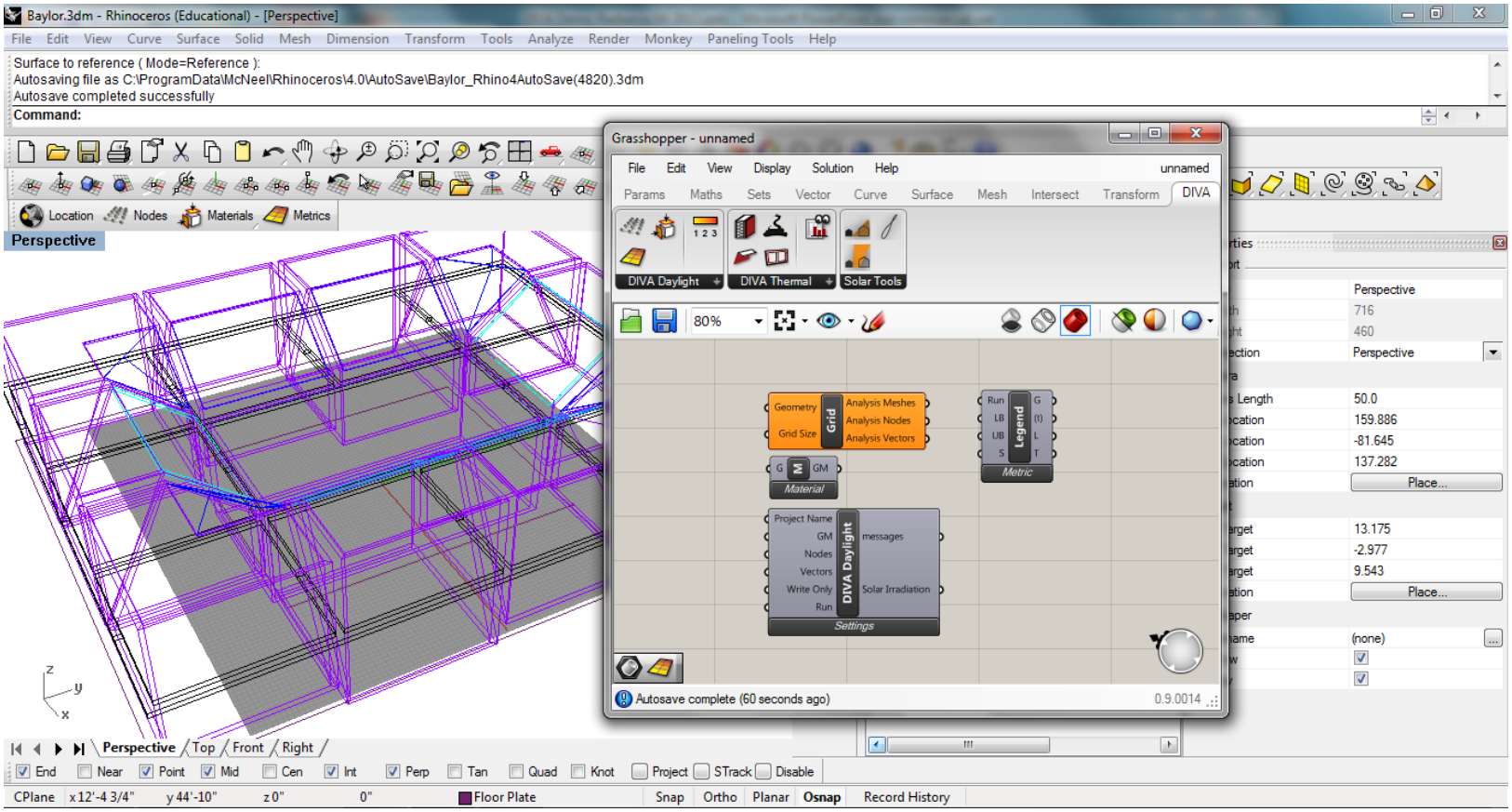
Static Geometry

Dynamic Geometry

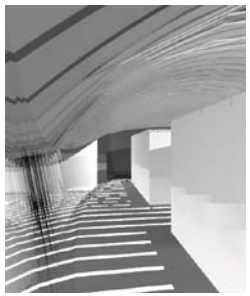
The Rhino/DIVA Interface



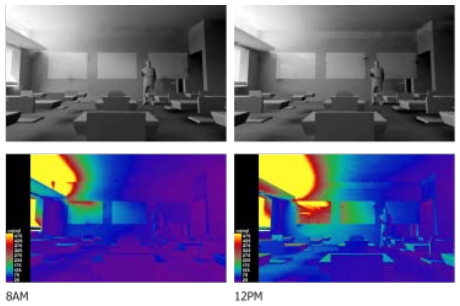
The Grasshopper/DIVA Interface



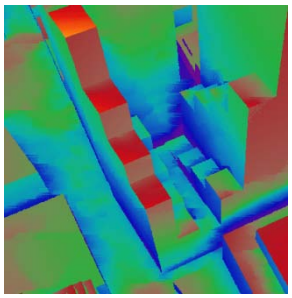
Visualizations



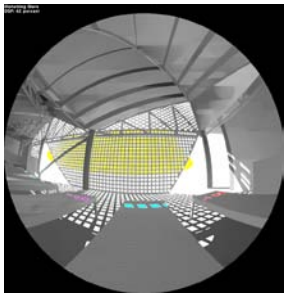
Single



Timestep



Solar Irradiance



Glare

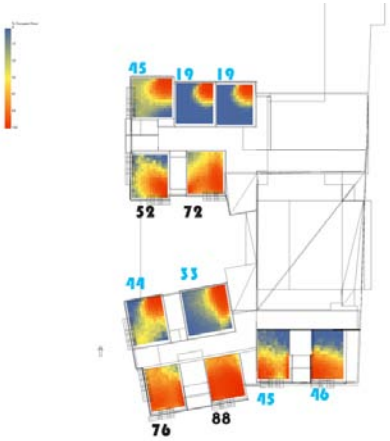
Annual Glare

Output: Images (.pic, .tif)

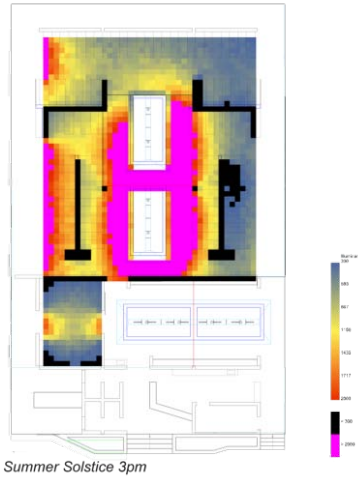
Multiple viewpoints in one simulation

Use wxfalsecolor to display/apply post processing

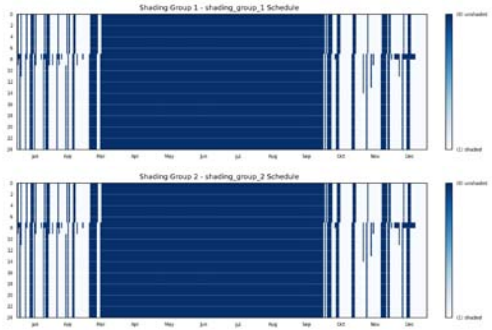
Point-based calculations



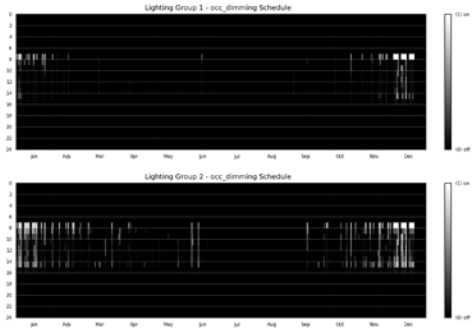
Climate Based Metrics (DA, CDA, UDI, Daylight Availability)



Point-in-Time Illuminance



Daylight Autonomy with Advanced Shading Schedules



Daylight Autonomy with Electric Lighting Schedules

And…

Daylight Factor, Solar Irradiance

MACHPS, NECHPS, LEED EQ 8.1

Single Zone Thermal Calculations

Grasshopper Simulations

DIVA-for-Grasshopper

- Radiation Point Calculations
- Solar Irradiance Visualizations
- RGB Visualizations
- Illuminance
- Climate Based Metrics

Viper

- Single Zone Energy

Non-Radiance based tools

- Solar Fan
- Solar Envelope
- Solar Position Calculator

System Requirements and Versions

System Requirements

- Rhino 4.0 SR 9
- Rhino 5.0 SR 3
- Current Grasshopper version for either Rhino 4.0 or Rhino 5.0

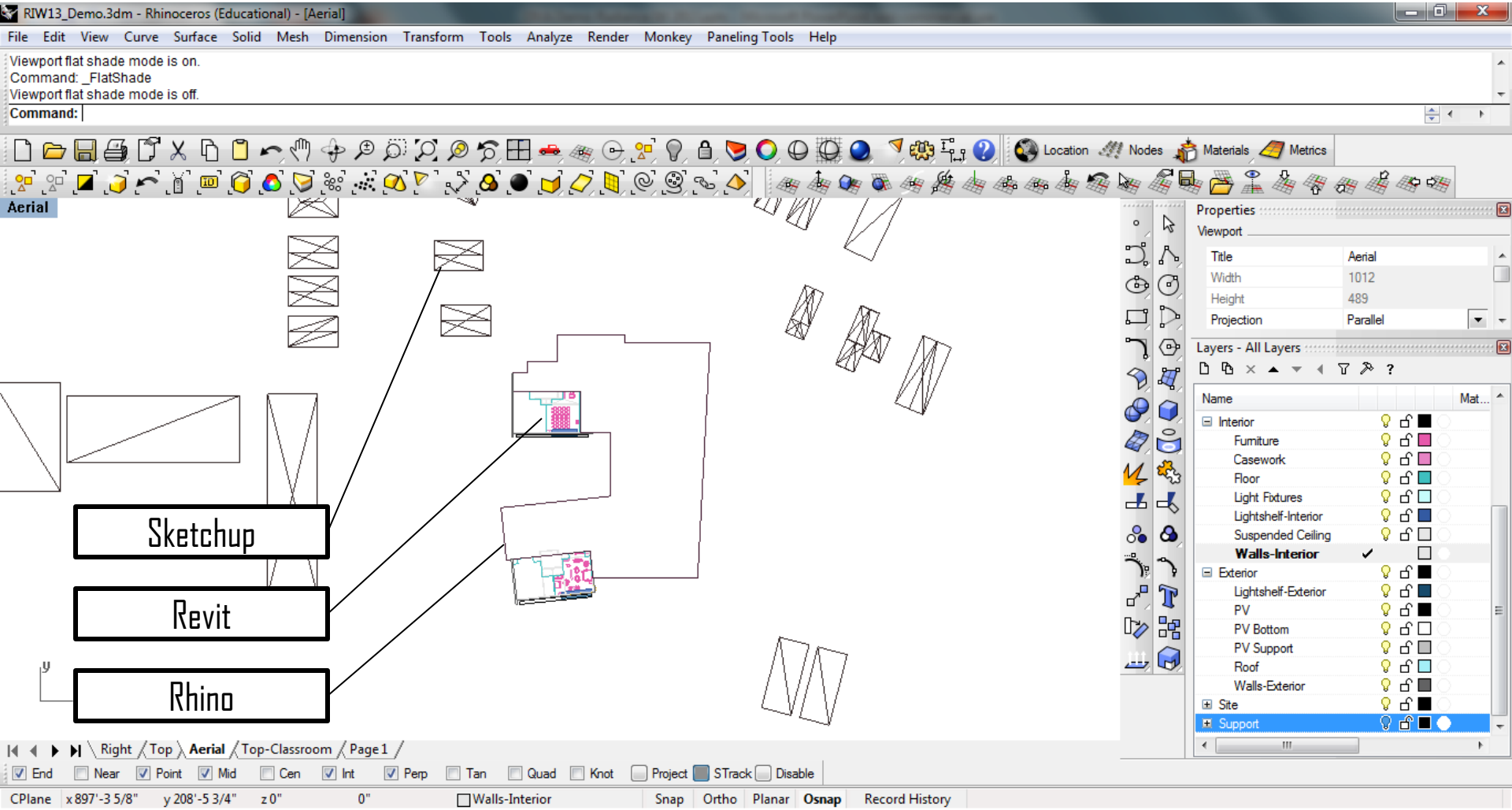
Versions of DIVA

- 2.1.0.3 Beta
- 2.0.1.3 Stable Build
- 1.9.0.1 Legacy

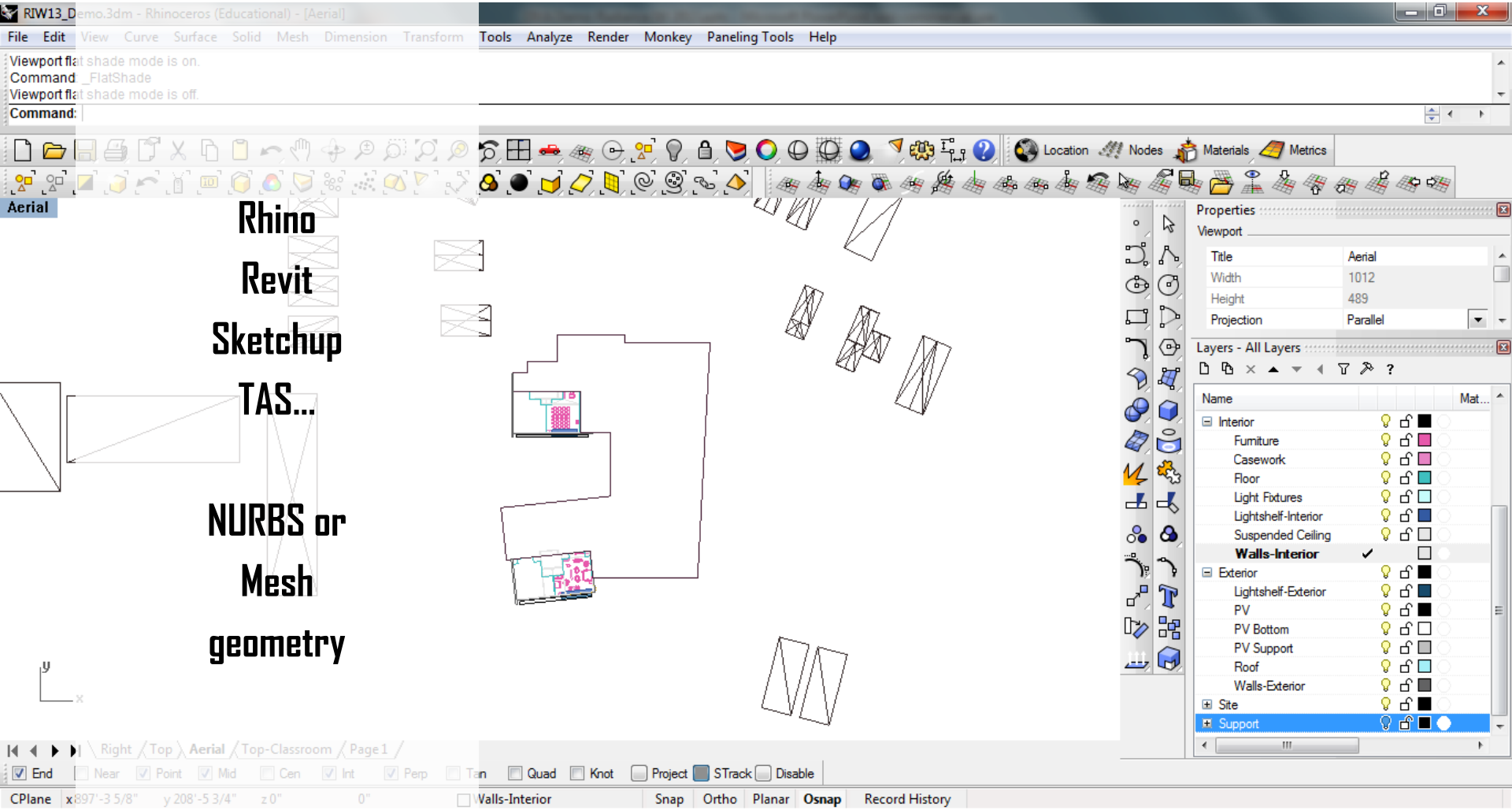
Versions of simulation engines (in 2.1.0.3 Beta)

- Radiance 4.2
- Daysim 4.0
- Evalglare 1.11
- Energy Plus 7.2
- Wxfalsecolor 0.51 (r97)

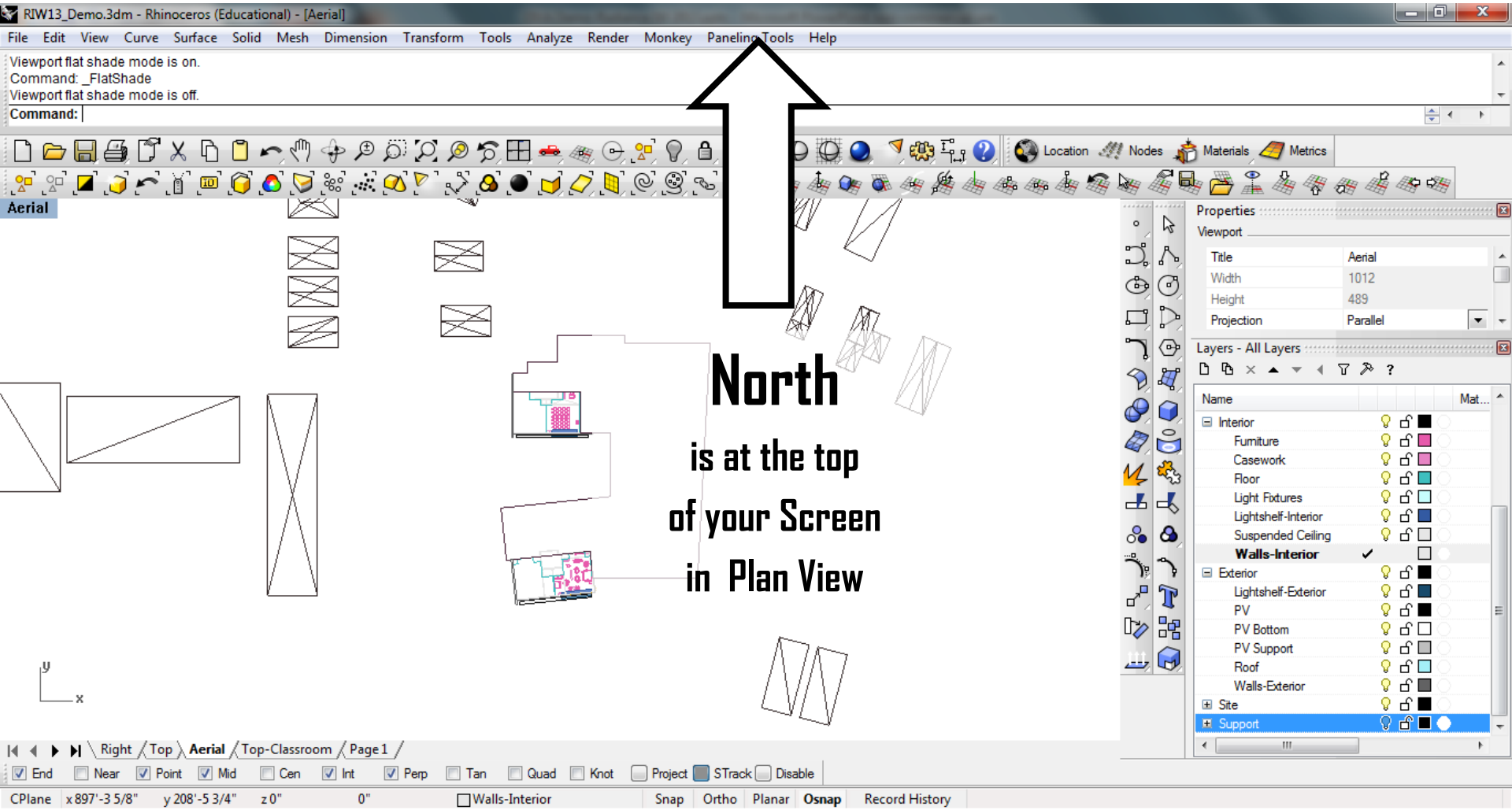
The Model


RIW13_Demo.3dm - Rhinoceros (Educational) - [Aerial]
File Edit View Curve Surface Solid Mesh Dimension Transform Tools Analyze Render Monkey Paneling Tools Help
Viewport flat shade mode is on.
Command: _FlatShade
Viewport flat shade mode is off.
Command:
Location Nodes Materials Metrics
Aerial
Properties
Viewport
Title Aerial
Width 1012
Height 489
Projection Parallel
Layers - All Layers
Name
Interior
Furniture
Casework
Floor
Light Fixtures
Lightshelf-Interior
Suspended Ceiling
Walls-Interior
Exterior
Lightshelf-Exterior
PV
PV Bottom
PV Support
Roof
Walls-Exterior
Site
Support
Sketchup
Revit
Rhino
Right Top Aerial Top-Classroom Page 1
End Near Point Mid Cen Int Perp Tan Quad Knot Project STrack Disable
CPlane x 897'-3 5/8" y 208'-5 3/4" z 0" 0" Walls-Interior Snap Ortho Planar Osnap Record History

File Types

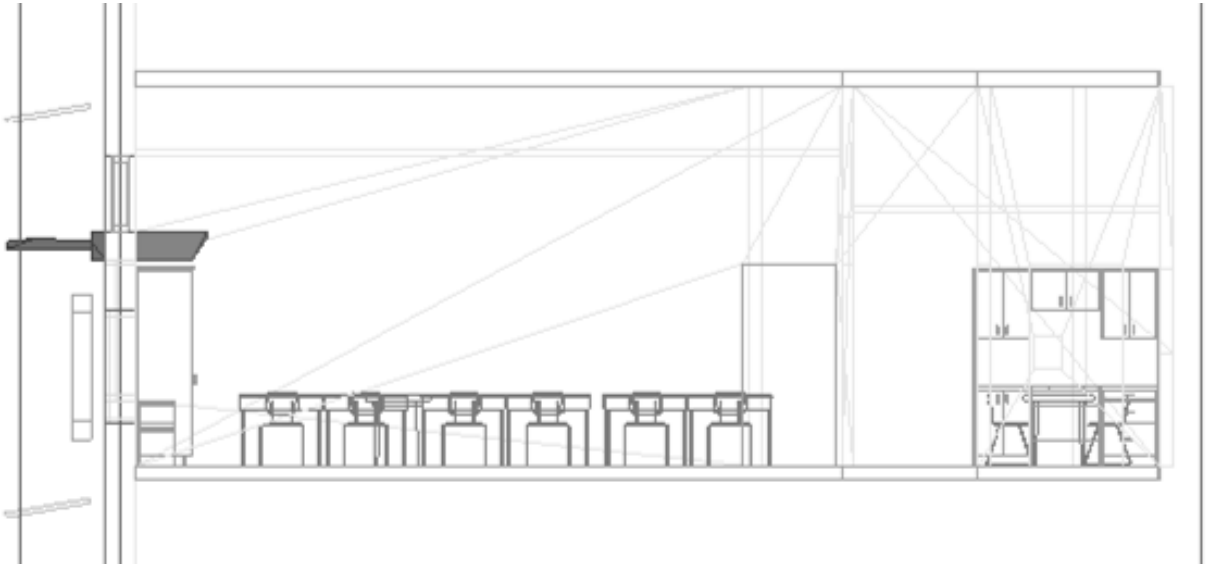


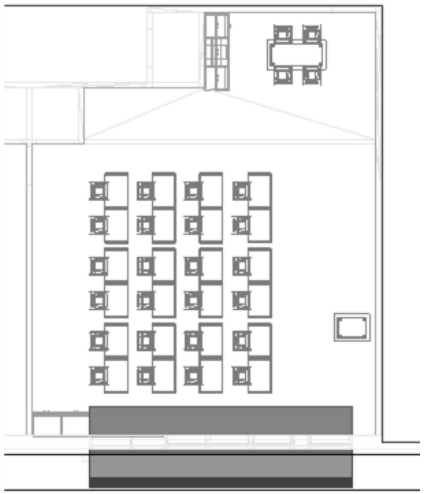
Orientation



Demo

South facing classroom





The Toolbar

The Toolbar

Select your Project location

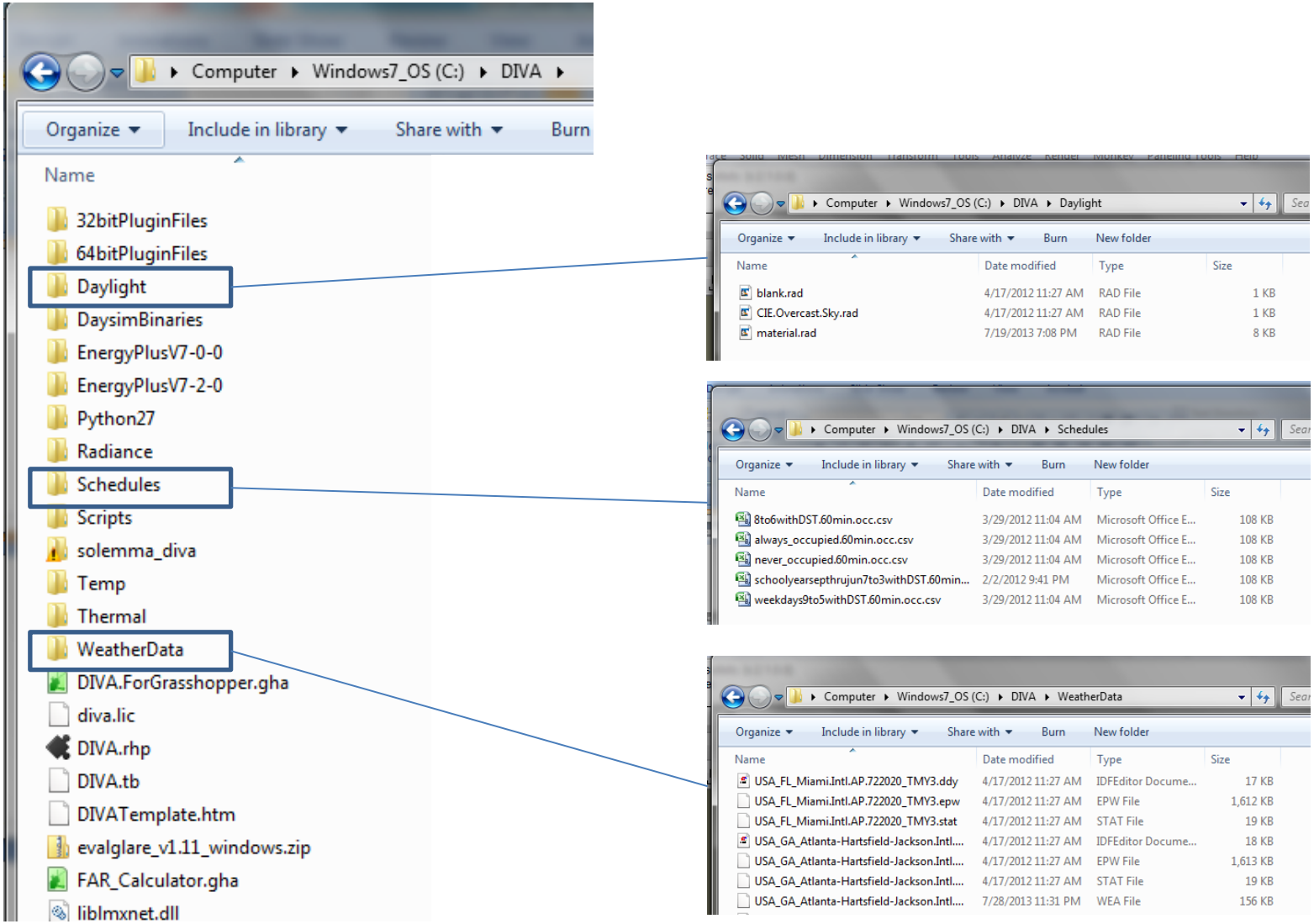
DIVA Layers created

Add locations by saving .epw files to the C:\DIVA\WeatherData folder

***Tip**

Select the wrong location by accident?
Just press the Location button again.

C:\DIVA


Computer ▸ Windows7_OS (C:) ▸ DIVA ▸
Organize
Include in library
Share with
Burn
Name
32bitPluginFiles
64bitPluginFiles
Daylight
DaysimBinaries
EnergyPlusV7-0-0
EnergyPlusV7-2-0
Python27
Radiance
Schedules
Scripts
solemma_diva
Temp
Thermal
WeatherData
DIVA.ForGrasshopper.gha
diva.lic
DIVA.rhp
DIVA.tb
DIVATemplate.htm
evalglare_v1.11_windows.zip
FAR_Calculator.gha
liblmxnet.dll
Computer ▸ Windows7_OS (C:) ▸ DIVA ▸ Daylight
Organize
Include in library
Share with
Burn
New folder
Name
Date modified
Type
Size
blank.rad 4/17/2012 11:27 AM RAD File 1 KB
CIE.Overcast.Sky.rad 4/17/2012 11:27 AM RAD File 1 KB
material.rad 7/19/2013 7:08 PM RAD File 8 KB
Computer ▸ Windows7_OS (C:) ▸ DIVA ▸ Schedules
Organize
Include in library
Share with
Burn
New folder
Name
Date modified
Type
Size
8to6withDST.60min.occ.csv 3/29/2012 11:04 AM Microsoft Office E... 108 KB
always_occupied.60min.occ.csv 3/29/2012 11:04 AM Microsoft Office E... 108 KB
never_occupied.60min.occ.csv 3/29/2012 11:04 AM Microsoft Office E... 108 KB
schoolyearsepthrujun7to3withDST.60min... 2/2/2012 9:41 PM Microsoft Office E... 108 KB
weekdays9to5withDST.60min.occ.csv 3/29/2012 11:04 AM Microsoft Office E... 108 KB
Computer ▸ Windows7_OS (C:) ▸ DIVA ▸ WeatherData
Organize
Include in library
Share with
Burn
New folder
Name
Date modified
Type
Size
USA_FL_Miami.Intl.AP.722020_TMY3.ddy 4/17/2012 11:27 AM IDFEditor Docume... 17 KB
USA_FL_Miami.Intl.AP.722020_TMY3.epw 4/17/2012 11:27 AM EPW File 1,612 KB
USA_FL_Miami.Intl.AP.722020_TMY3.stat 4/17/2012 11:27 AM STAT File 19 KB
USA_GA_Atlanta-Hartsfield-Jackson.Intl.... 4/17/2012 11:27 AM IDFEditor Docume... 18 KB
USA_GA_Atlanta-Hartsfield-Jackson.Intl.... 4/17/2012 11:27 AM EPW File 1,613 KB
USA_GA_Atlanta-Hartsfield-Jackson.Intl.... 4/17/2012 11:27 AM STAT File 19 KB
USA_GA_Atlanta-Hartsfield-Jackson.Intl.... 7/28/2013 11:31 PM WEA File 156 KB

The Toolbar

Set your Sensor Nodes

Set the distance off of the plane (default is 30in.)
On center spacing (default is 15in.)
You can select multiple surfaces

*Tip

The default values are always 30 inches and 15 inches, but they are converted to the current model units.

The Toolbar

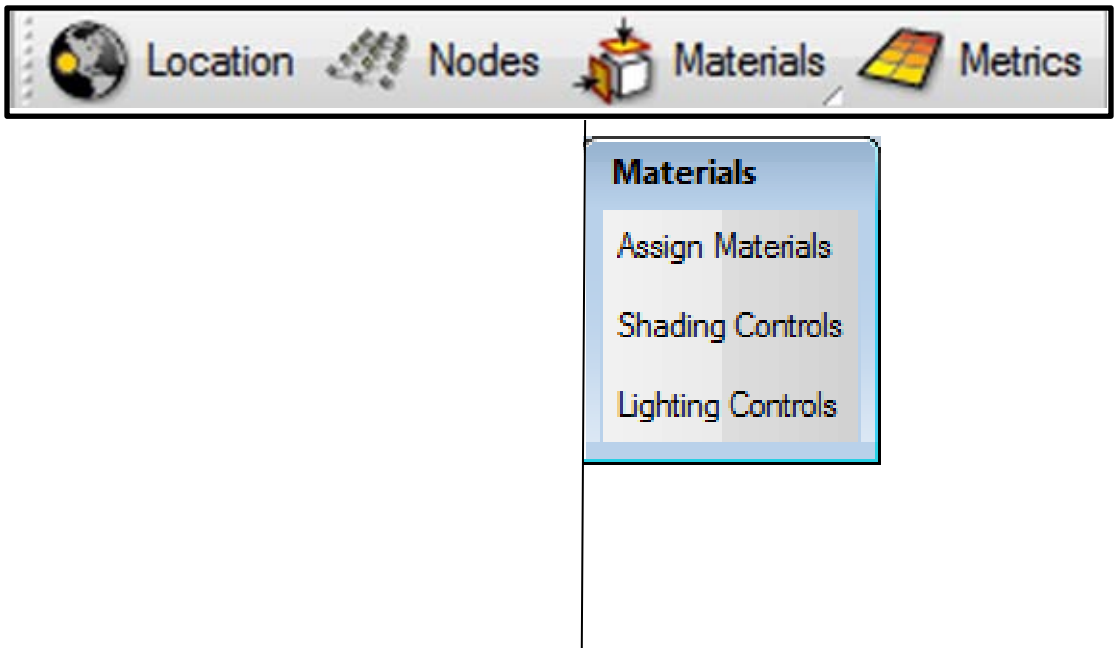
Select your materials

Modify the material.rad file and the materials will update in the dropdowns
C:\DIVA\Daylight\material.rad
C:\(Local folder)\RhinoFile.3dm – DIVA\Resources\material.rad

***Tip**

Geometry on layers not assigned a material will not be exported.

The Toolbar



Set Shading & Lighting Modules

These menus use the Dayism shading and lighting modules to simulate shading routines and electric lighting use when running Climate-Based Metrics.

The Toolbar

Run your metrics

Select from Visualizations, Grid-Based Methods, and Thermal Simulations

The Toolbar

Load in your metrics

Right click the Metrics button to load in previous results

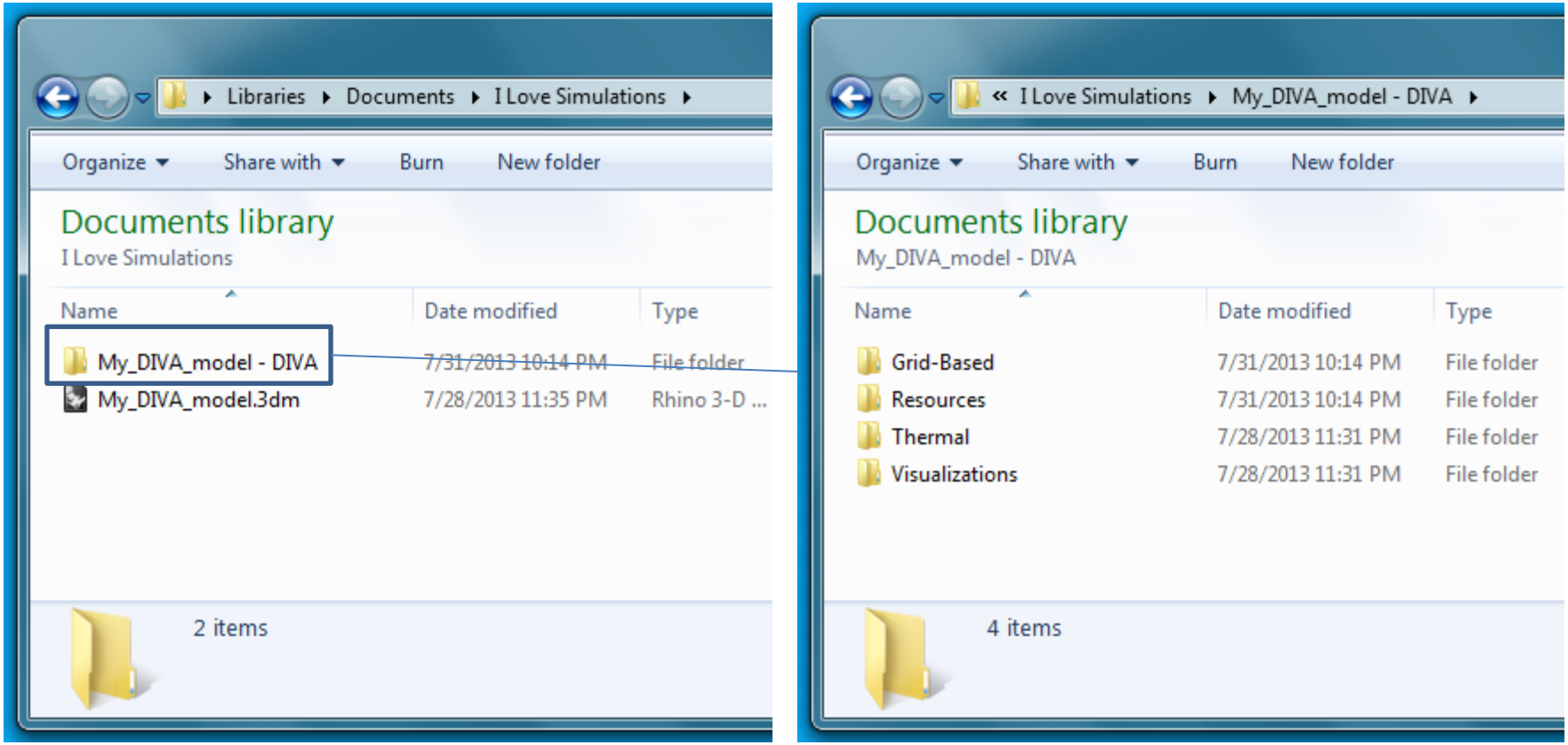
Demo

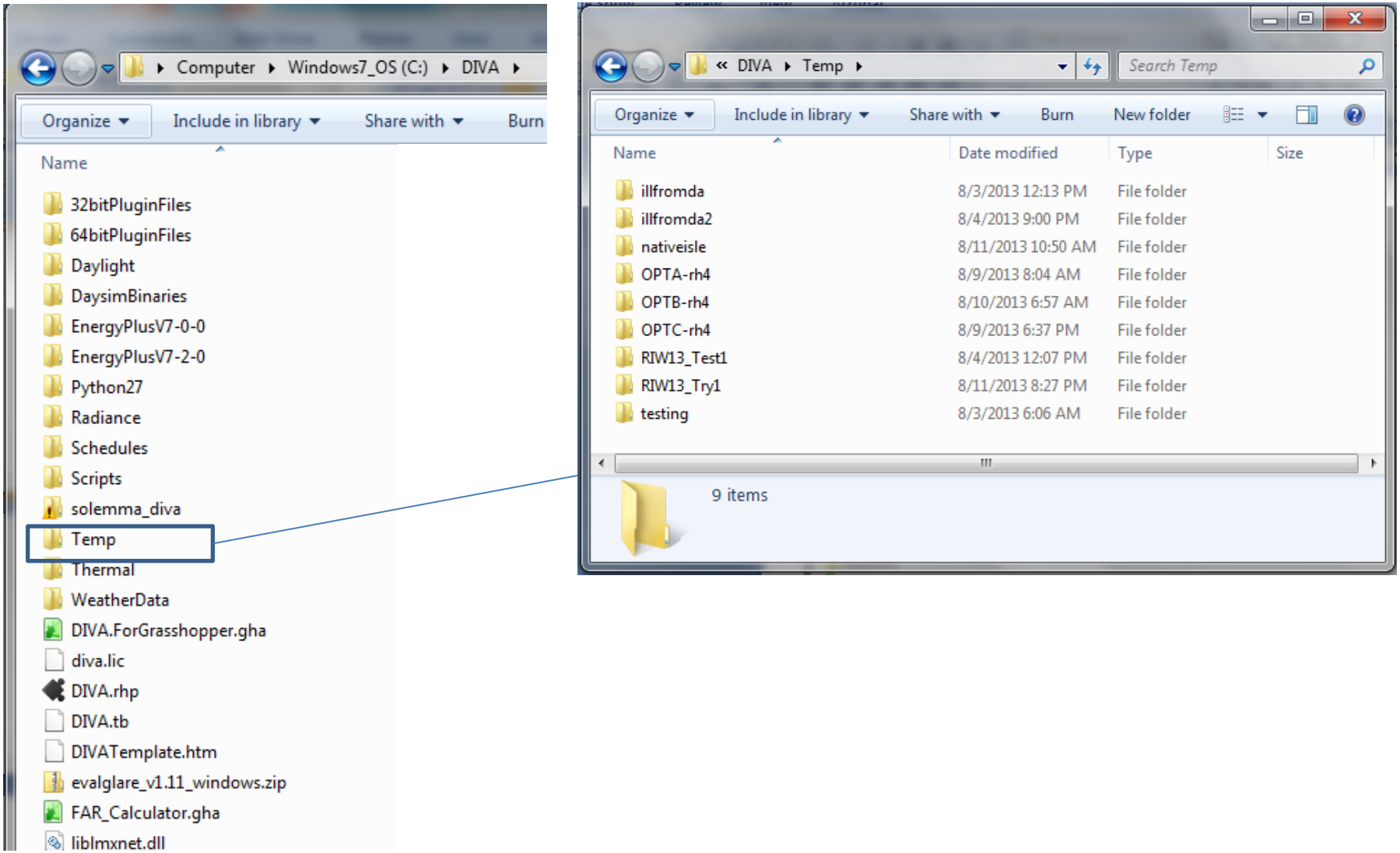
Running an Image-Based Metric

Running a Node-Based Metric

Reloading Results

Results Files

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DIVATemplate.htm
evalglare_v1.11_windows.zip
FAR_Calculator.gha
liblmxnet.dll
« DIVA ▸ Temp ▸
Search Temp
Organize
Include in library
Share with
Burn
New folder
Name
Date modified
Type
Size
illfromda 8/3/2013 12:13 PM File folder
illfromda2 8/4/2013 9:00 PM File folder
nativeisle 8/11/2013 10:50 AM File folder
OPTA-rh4 8/9/2013 8:04 AM File folder
OPTB-rh4 8/10/2013 6:57 AM File folder
OPTC-rh4 8/9/2013 6:37 PM File folder
RIW13_Test1 8/4/2013 12:07 PM File folder
RIW13_Try1 8/11/2013 8:27 PM File folder
testing 8/3/2013 6:06 AM File folder
9 items

Grasshopper & DIVA-for-Grasshopper

What is Grasshopper?

How can it be used?

How do you use DIVA-for-Grasshopper?

Thank you!

www.diva4rhino.com & www.solemma.net