IRIS EMC PARAVIEW PLUGINS; EXERCISE 1 - EARTHQUAKES

IRIS Data Services, Data Products Team, April 2019, V.2019.091

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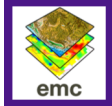
IRIS



CONTACT

Comments or questions?
Please contact:

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IRIS

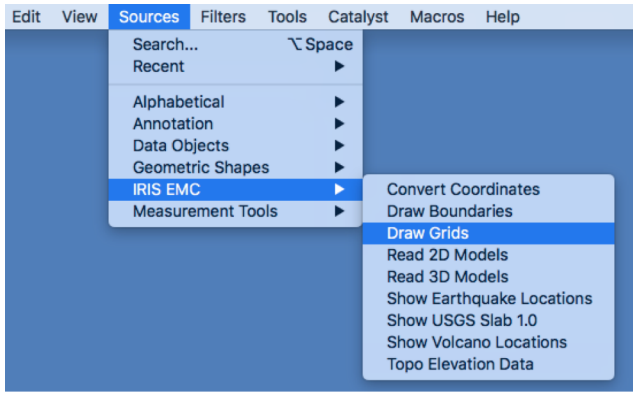
Objective

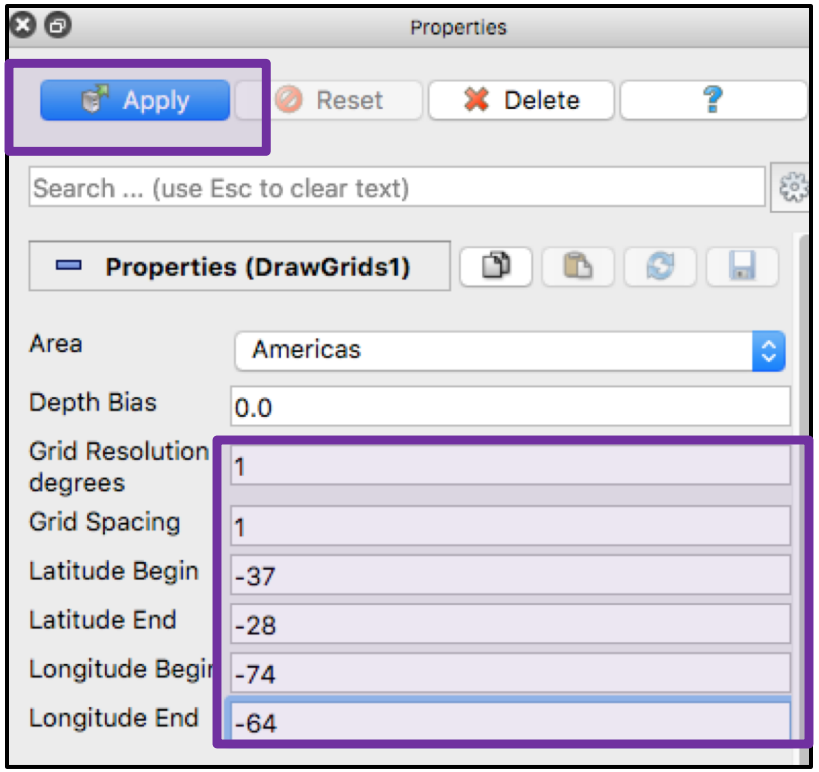
Use EMC plugins to plot auxiliary data (data other than Earth models) for the central Chile and western Argentina:

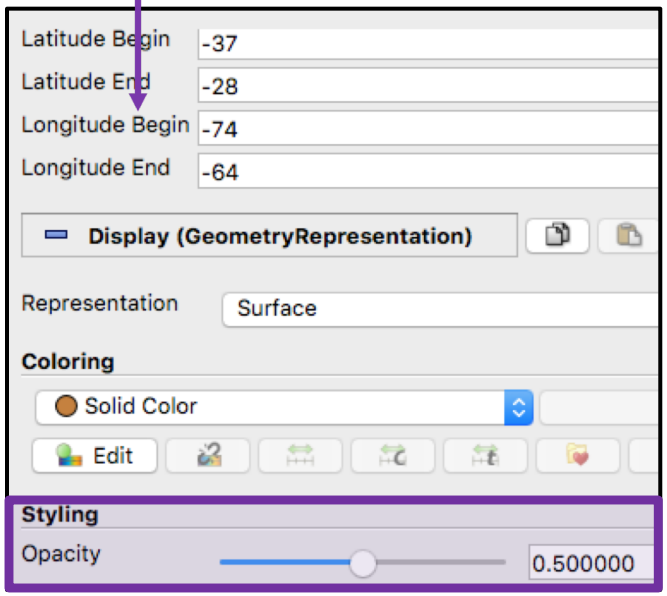
- Area latitude range -37 to -28 degrees
- Area longitude range -74 to -64 degrees
- Plot coastal boundaries, political boundaries and convergent plate boundaries
- Plot USGS Slab 1.0 model for the area
- Plot volcano locations
- Plot Earthquake locations up to depth of 200 km for M >=5 since 1970
- Plot elevation data

Draw the Grid Lines

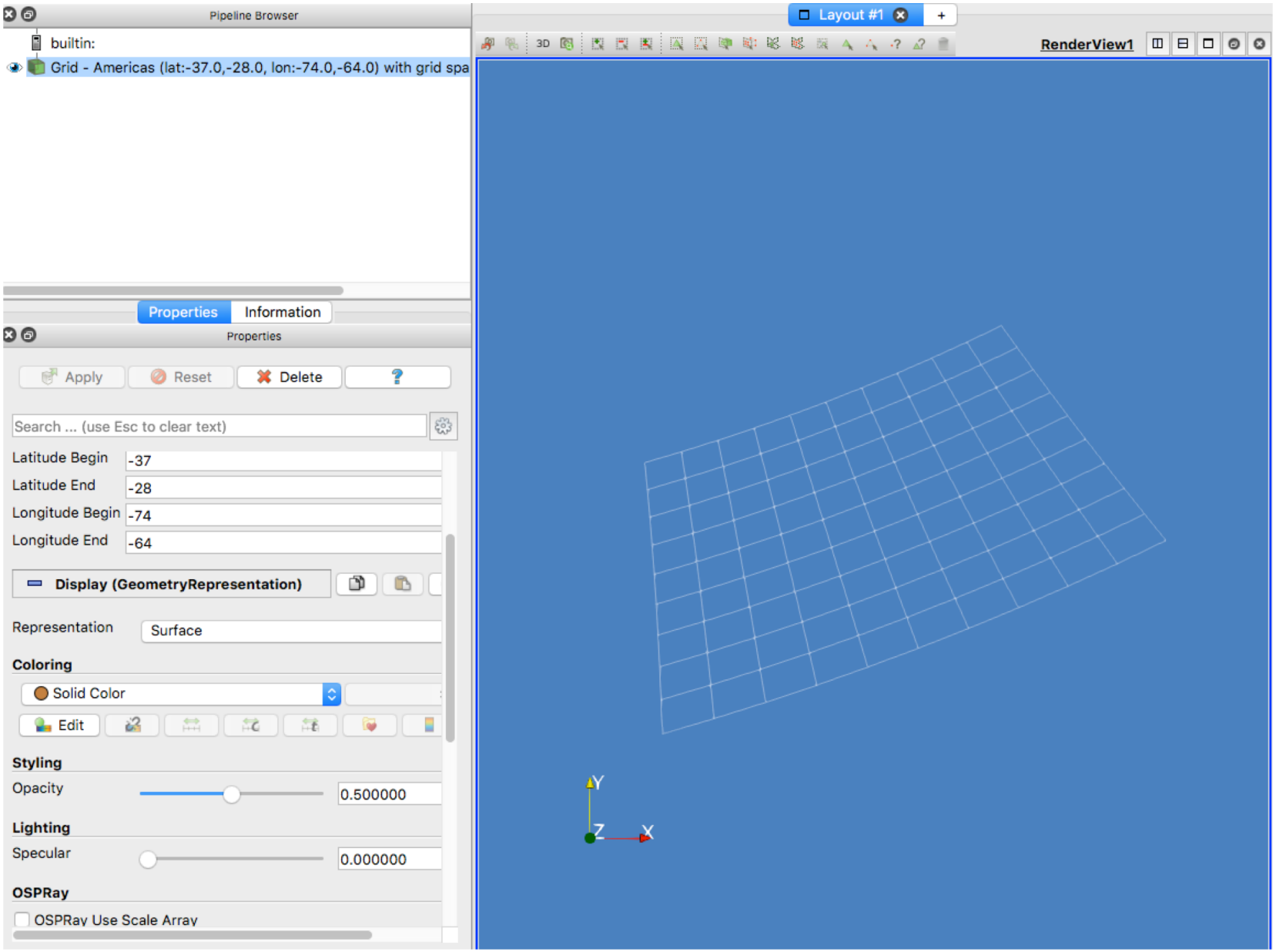
- Open ParaView
- Select `Draw Grids` plugin
- Set the latitude and longitude limits. Set the grid spacing to 1 and click `Apply`
- Reduce the `Opacity` of the grid lines to 0.5





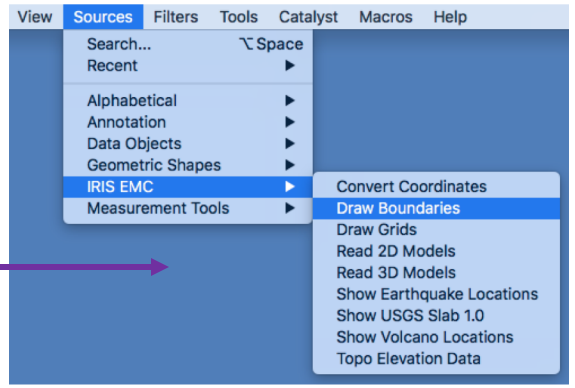


Draw Grid Lines

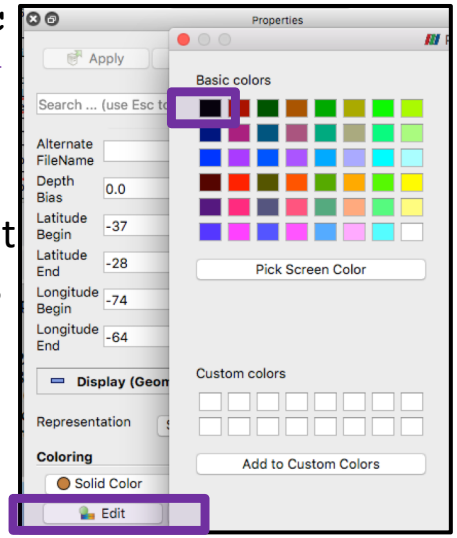


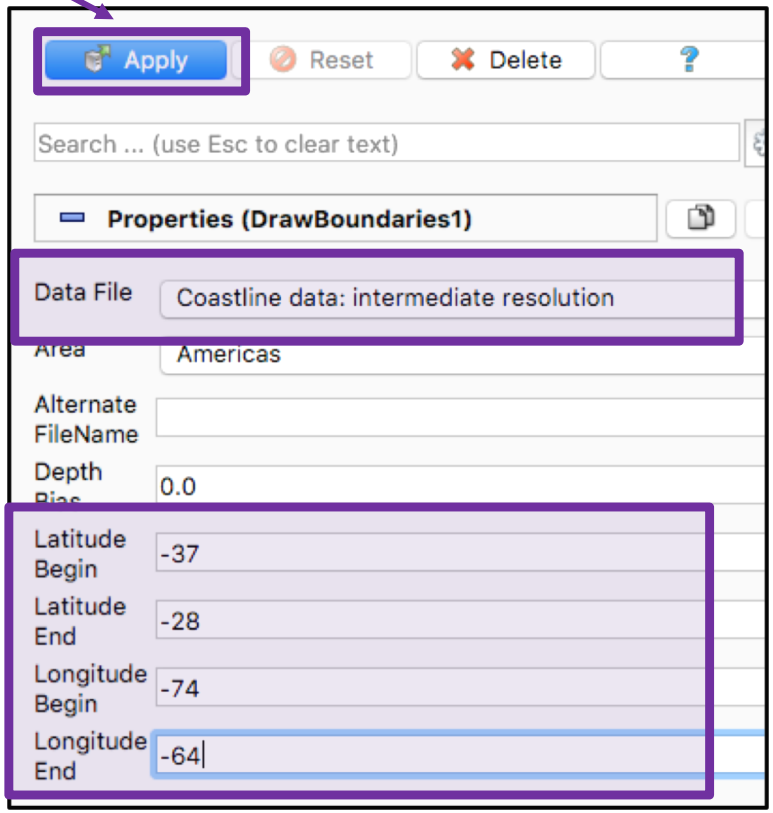
Draw Boundaries

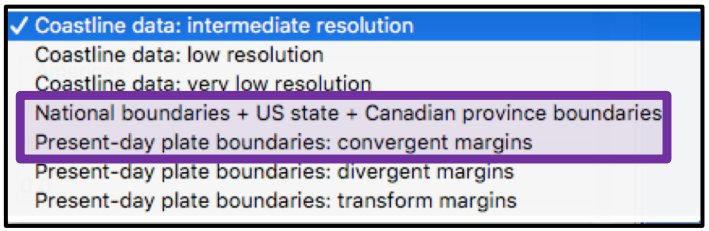
We need three different boundary lines. Each will require a separate call to `Draw Boundaries` plugin

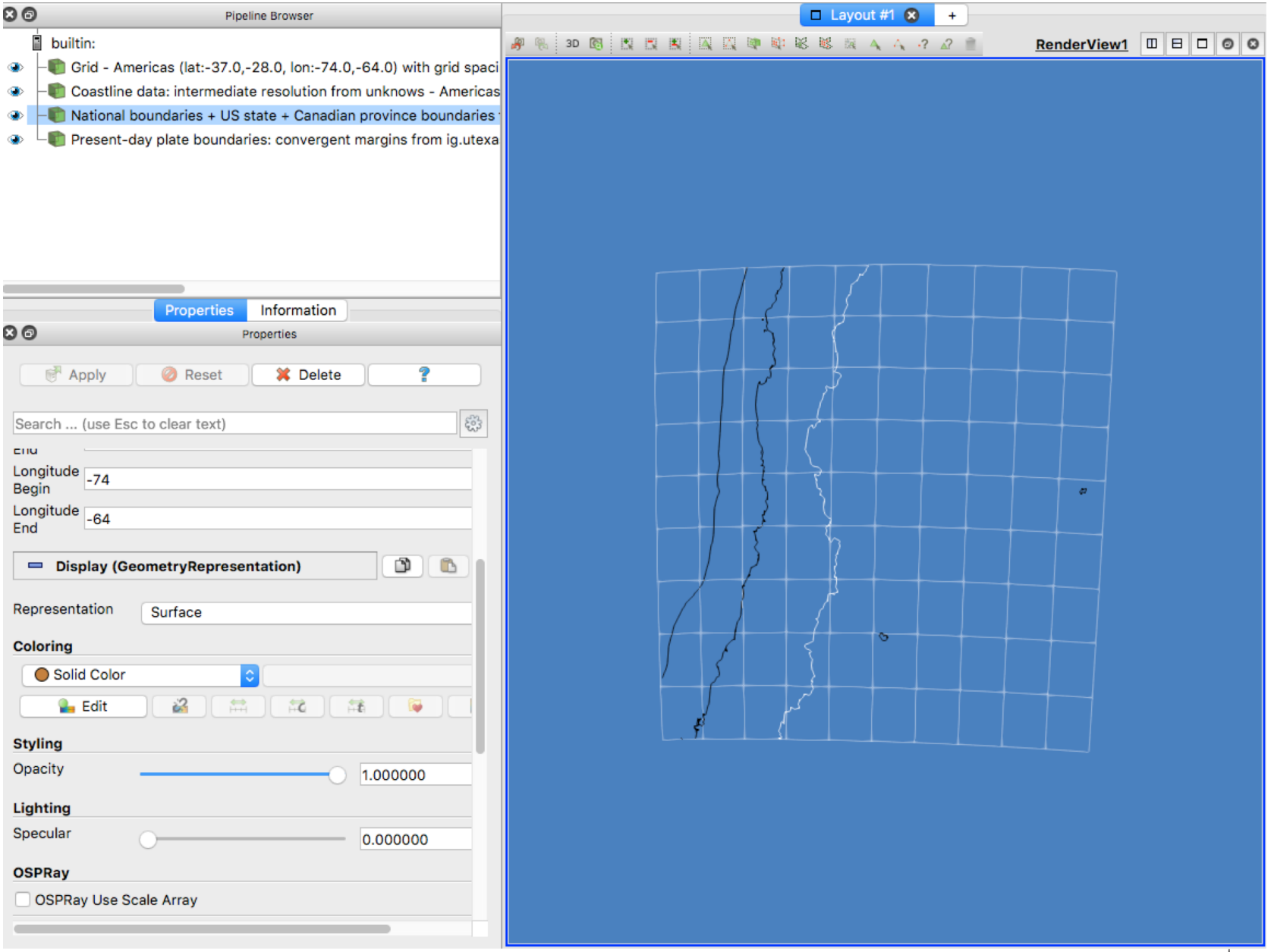


- Select `intermediate resolution` coastline, set the latitude and longitude limits and click `Apply`.
- To change the boundary line color to black, select `Edit` under `Coloring` and select black color from the `Basic colors`.
- Select `Draw Boundaries` two more times and repeat the same sequence as above for national boundaries and convergent margins (Note: do not change the color of the national boundaries to black).



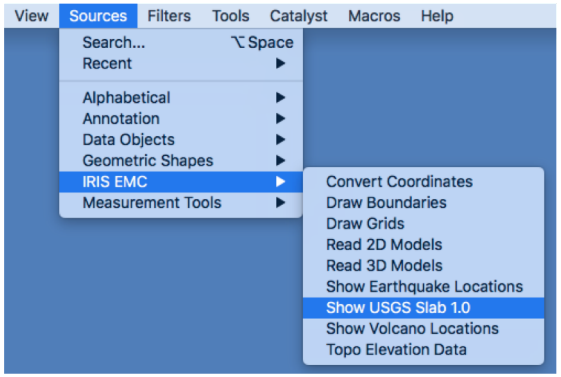




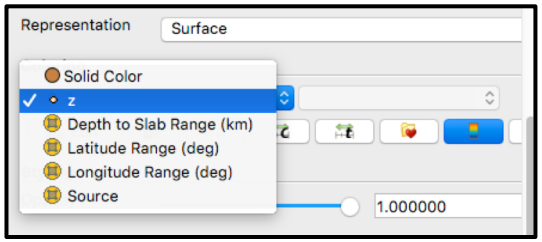

Pipeline Browser
builtin:
Grid - Americas (lat:-37.0,-28.0, lon:-74.0,-64.0) with grid spaci
Coastline data: intermediate resolution from unknows - Americas
National boundaries + US state + Canadian province boundaries
Present-day plate boundaries: convergent margins from ig.utexa
Properties
Information
Properties
Apply
Reset
Delete
Search ... (use Esc to clear text)
Longitude Begin
-74
Longitude End
-64
Display (GeometryRepresentation)
Representation
Surface
Coloring
Solid Color
Edit
Styling
Opacity
1.000000
Lighting
Specular
0.000000
OSPRay
OSPRay Use Scale Array
Layout #1
RenderView1

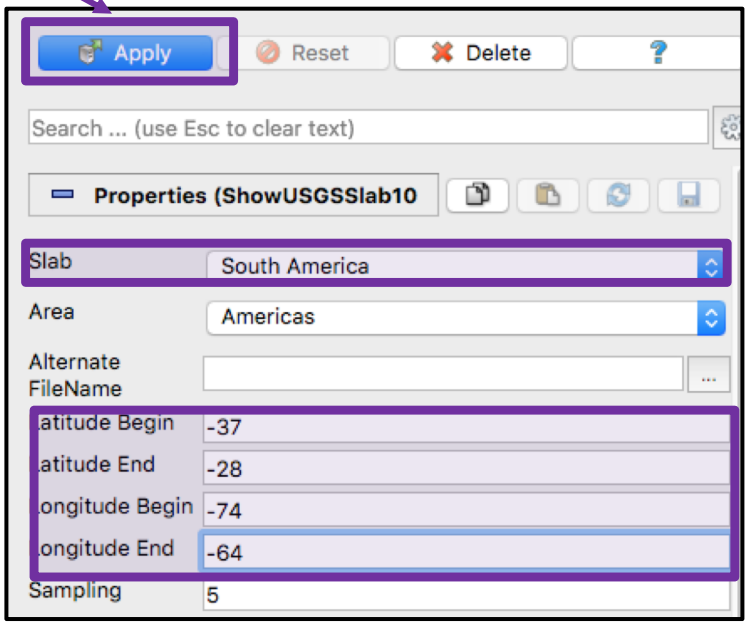
Draw USGS Slab 1.0 Model

Select `Show USGS Slab 1.0`

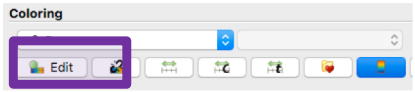


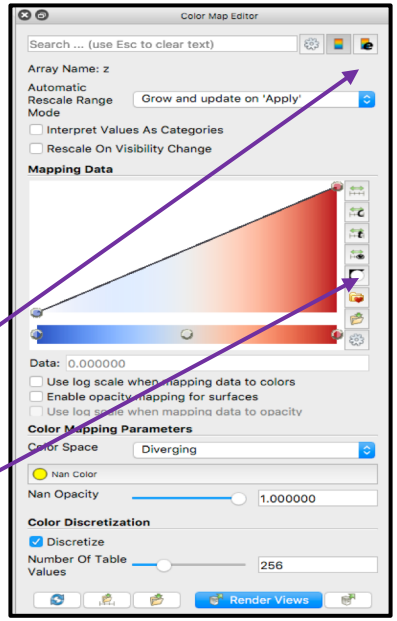
- Select the `South America` slab, set the latitude and longitude limits and click `Apply`.
- Change `Representation` to `surface` and select `z` for `Coloring`





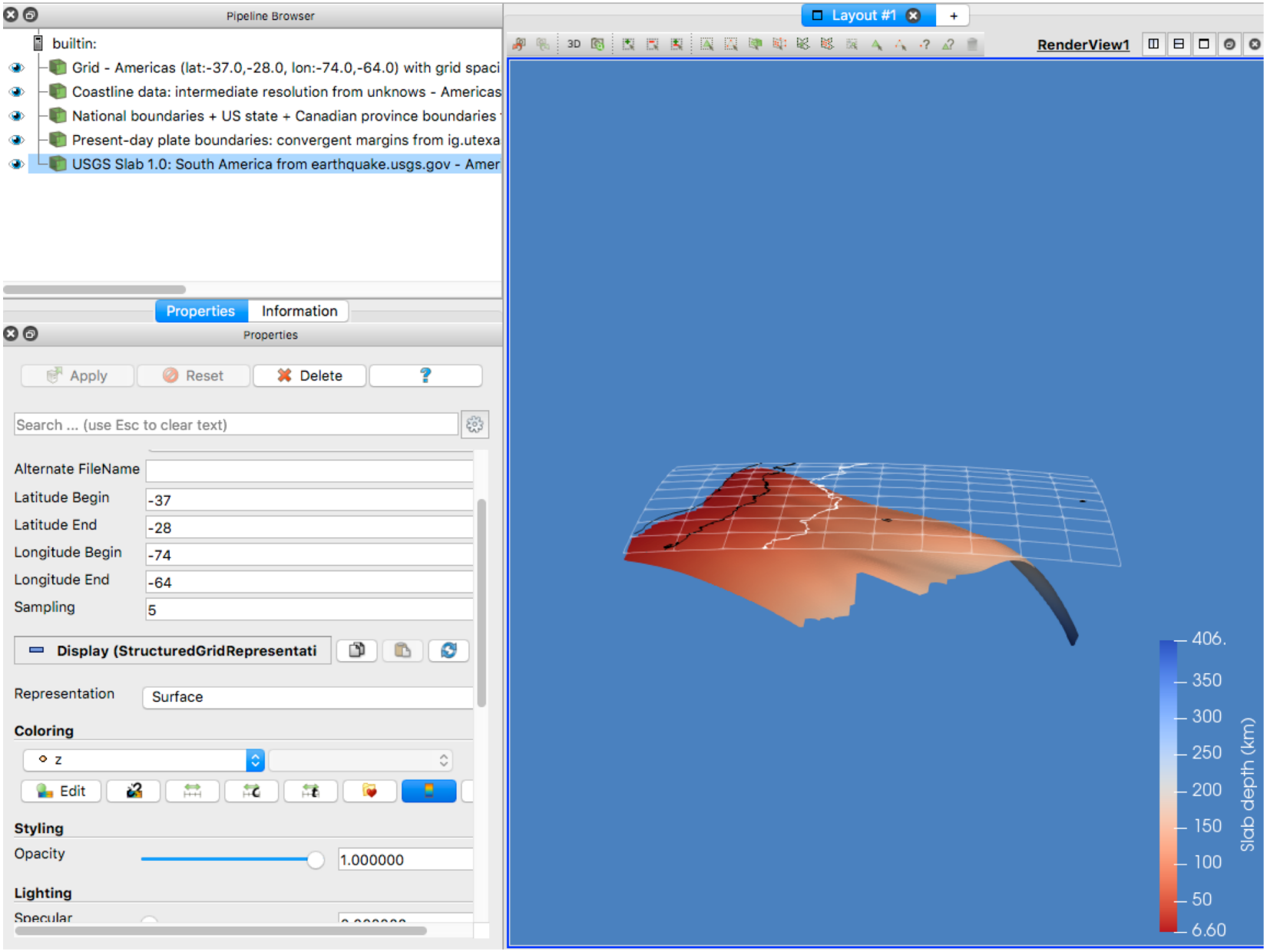
- To change the color scale, click `Edit` under `Coloring` to open the `Color Map Editor`:





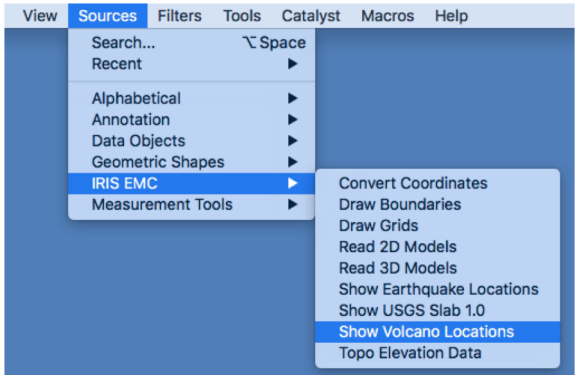
- `Color Map Editor` interface allows you to modify color and scale labeling:
  - Edit color legend
  - Invert colors

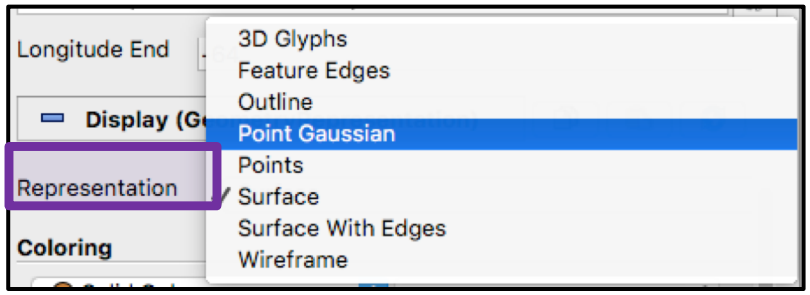
Draw USGS Slab 1.0 Model

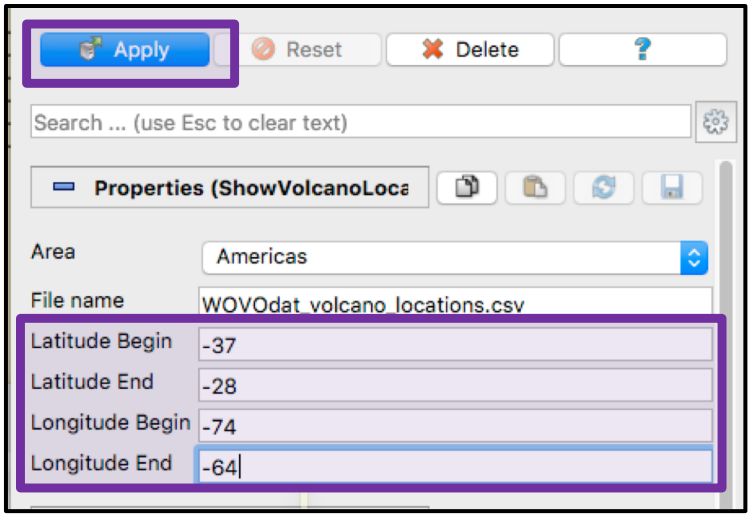


Add Volcano Locations

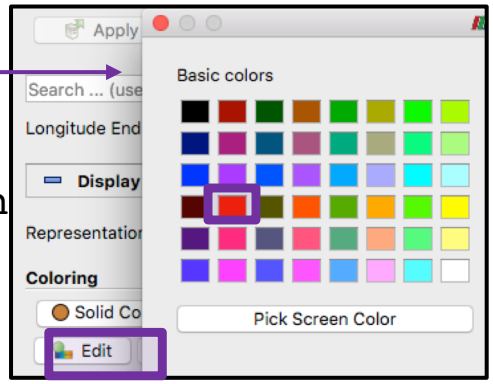
- Select `Show Volcano Locations` plugin
- Enter the latitude and longitude limits and click `Apply`.
- To plot red triangle markers, select `Point Gaussian` for `Representation`

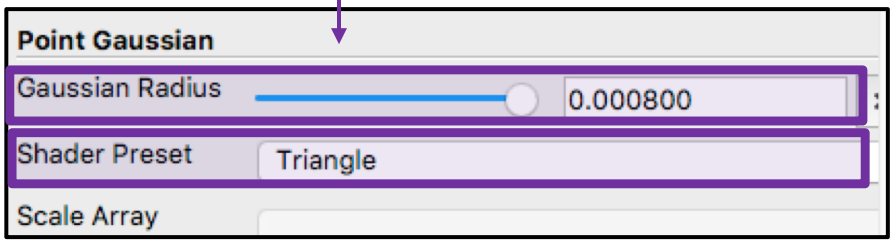




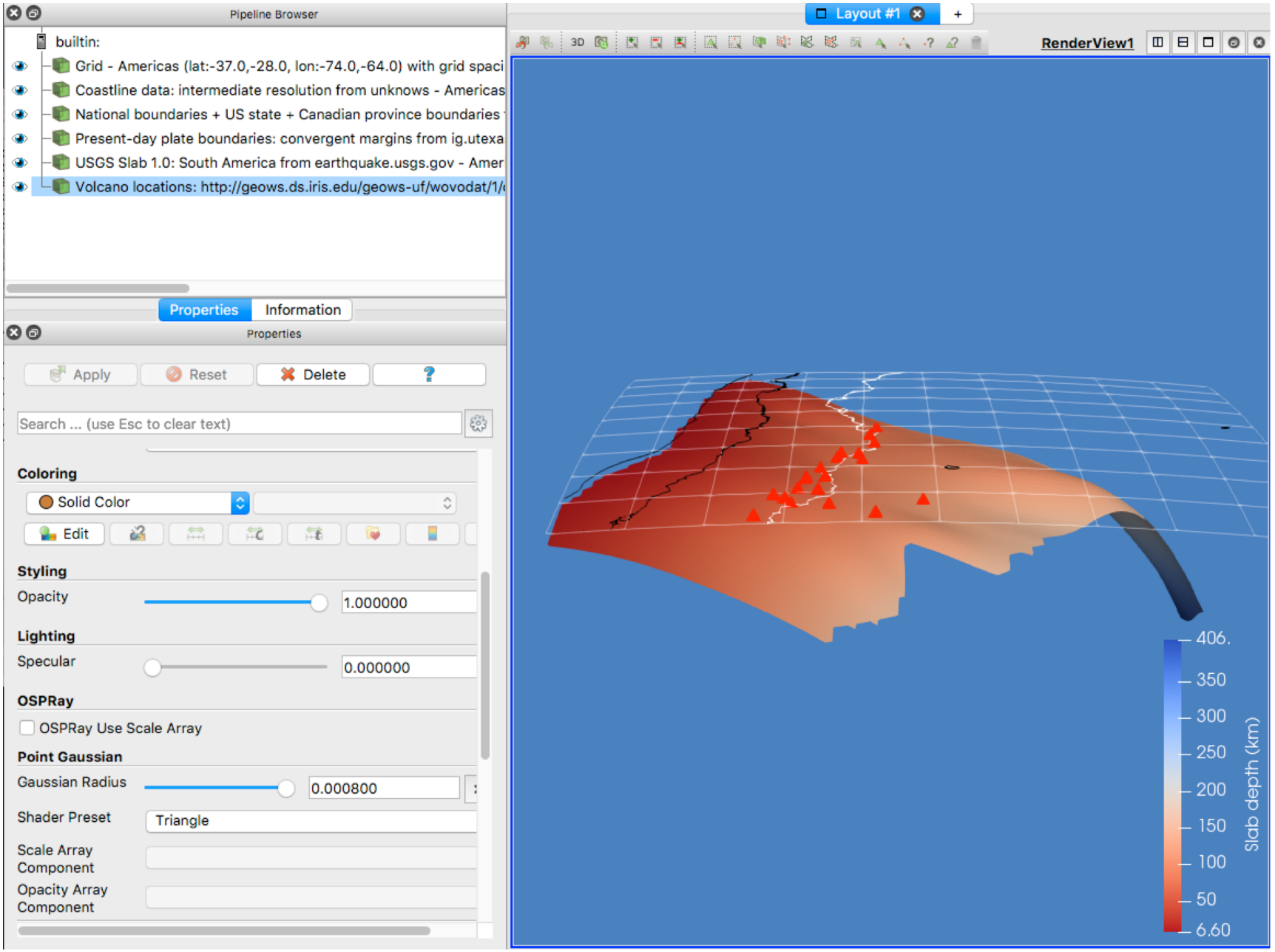


- Select red color under `Coloring`
- Set the `Point Gaussian` properties:
  - `Triangle` for `Shader Preset`
  - 0.0008 for Gaussian `Radius`



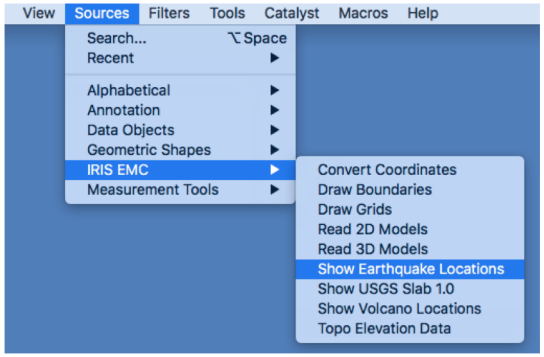


Add Volcano Locations

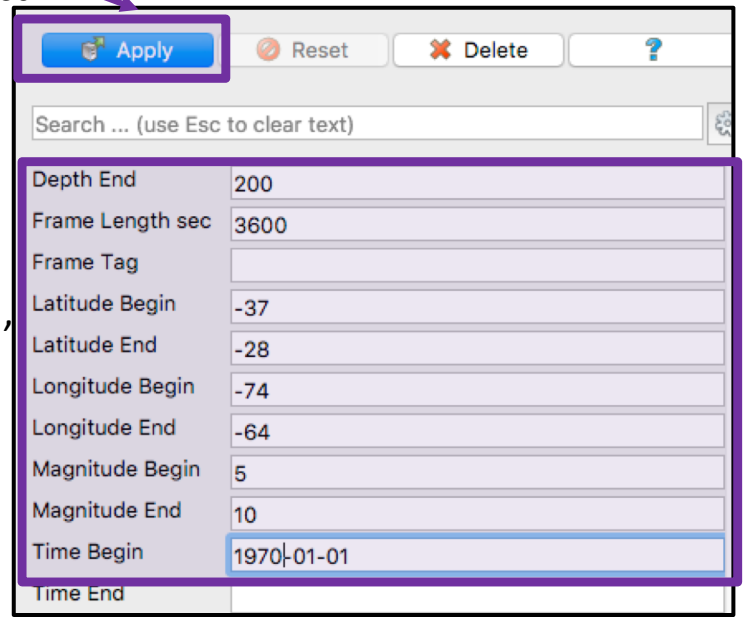


Add Earthquake Locations

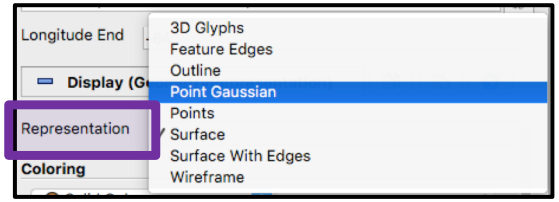
- Select `Show Earthquake Locations` plugin



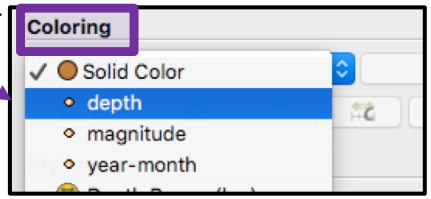
- Set the maximum depth 200 km, enter the latitude and longitude limits, minimum magnitude to 5, and the event time begin to 1970-01-01 and then click `Apply`.



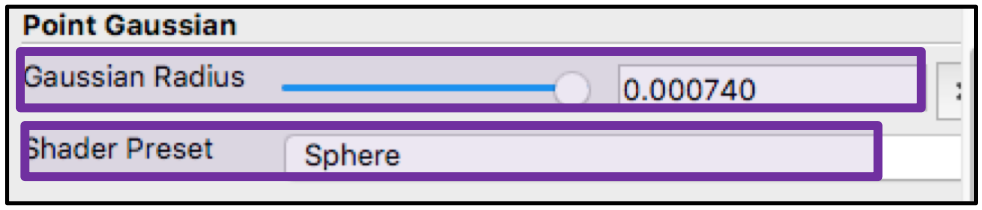
- To plot circle markers at earthquake locations, select `Point Gaussian` for `Representation`



- To color earthquake locations based on their depth, `Coloring` select `depth`

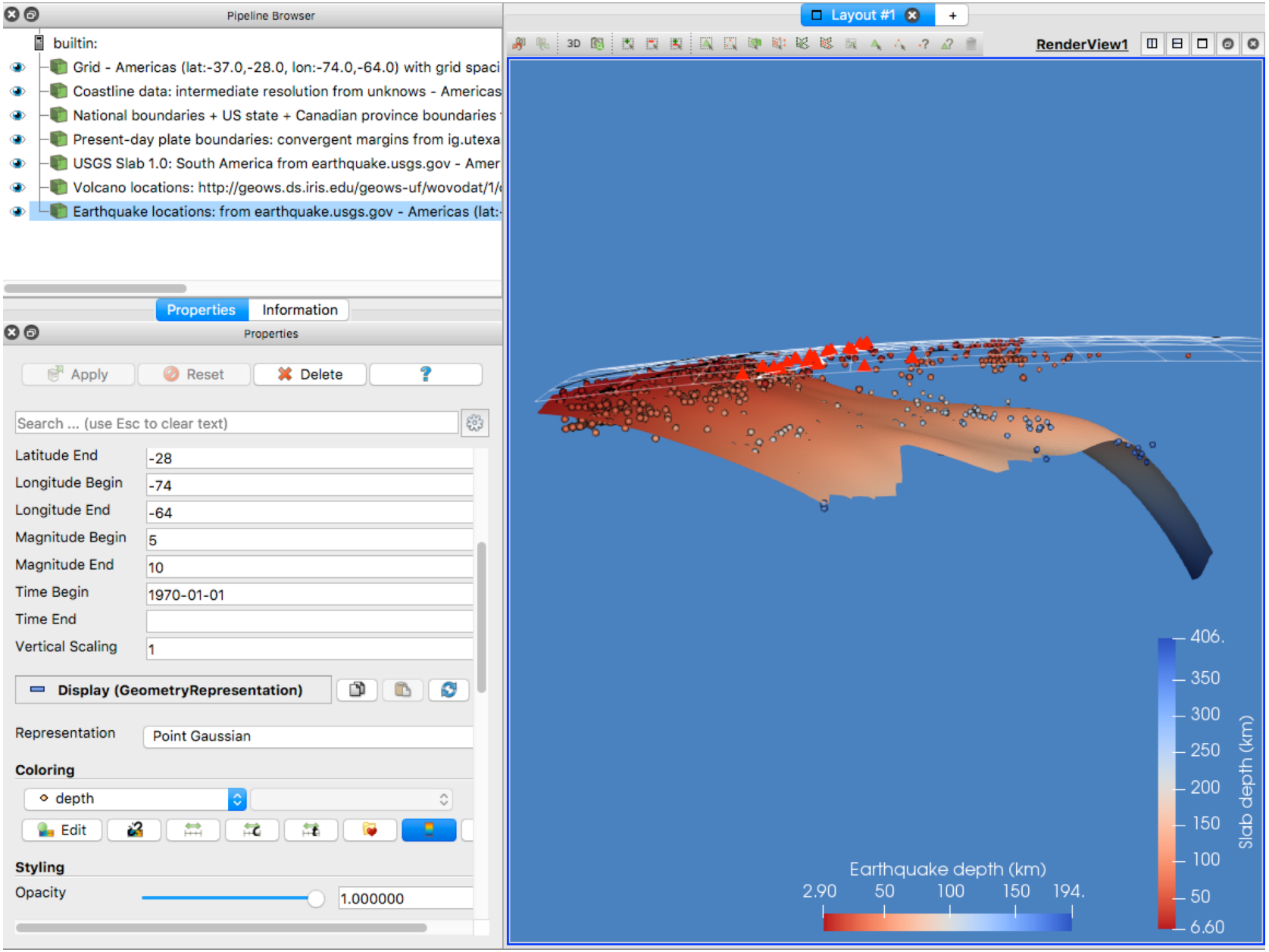


- For the `Point Gaussian` properties select `Sphere` for the `Shader Preset` and set Gaussian `Radius` to 0.00074



- Update the color scale as before, if desired

Add Earthquake Locations

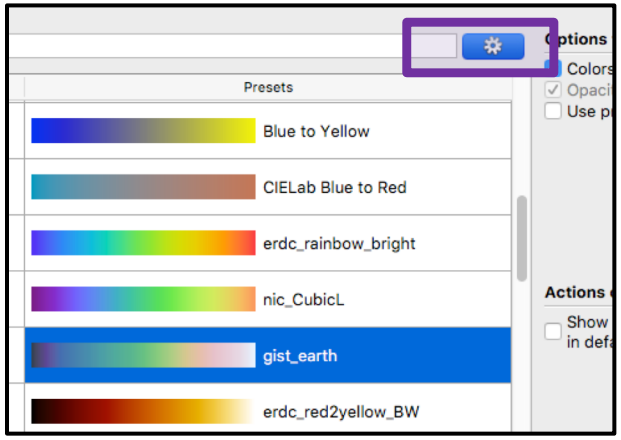


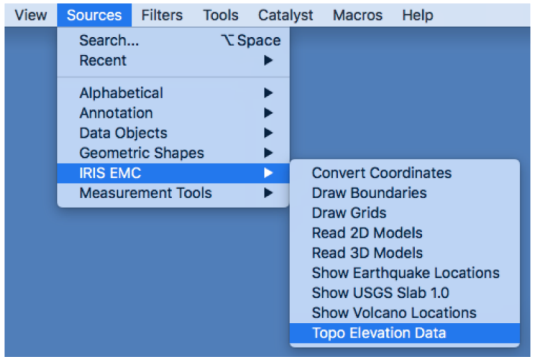
Add Elevation Data

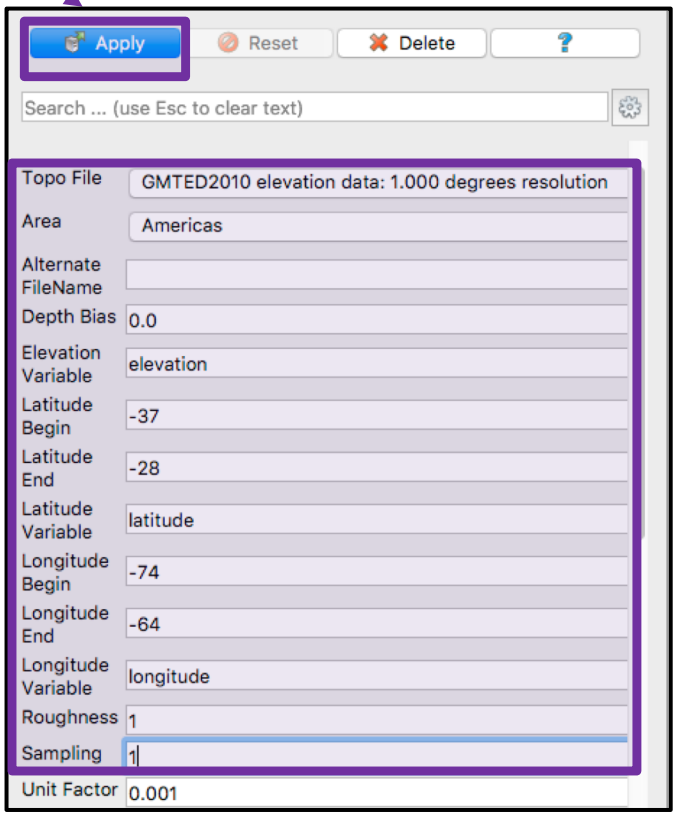
- Select `Topo Elevation Data` plugin
- Select a topo file with the desired resolution, enter the latitude and longitude limits and set sampling to 1 to use all data then click `Apply`.
- Under `Styling` set `Opacity` to see data below.

- Update the color scale as before and select the desired color palette by opening the `Choose Preset` window.

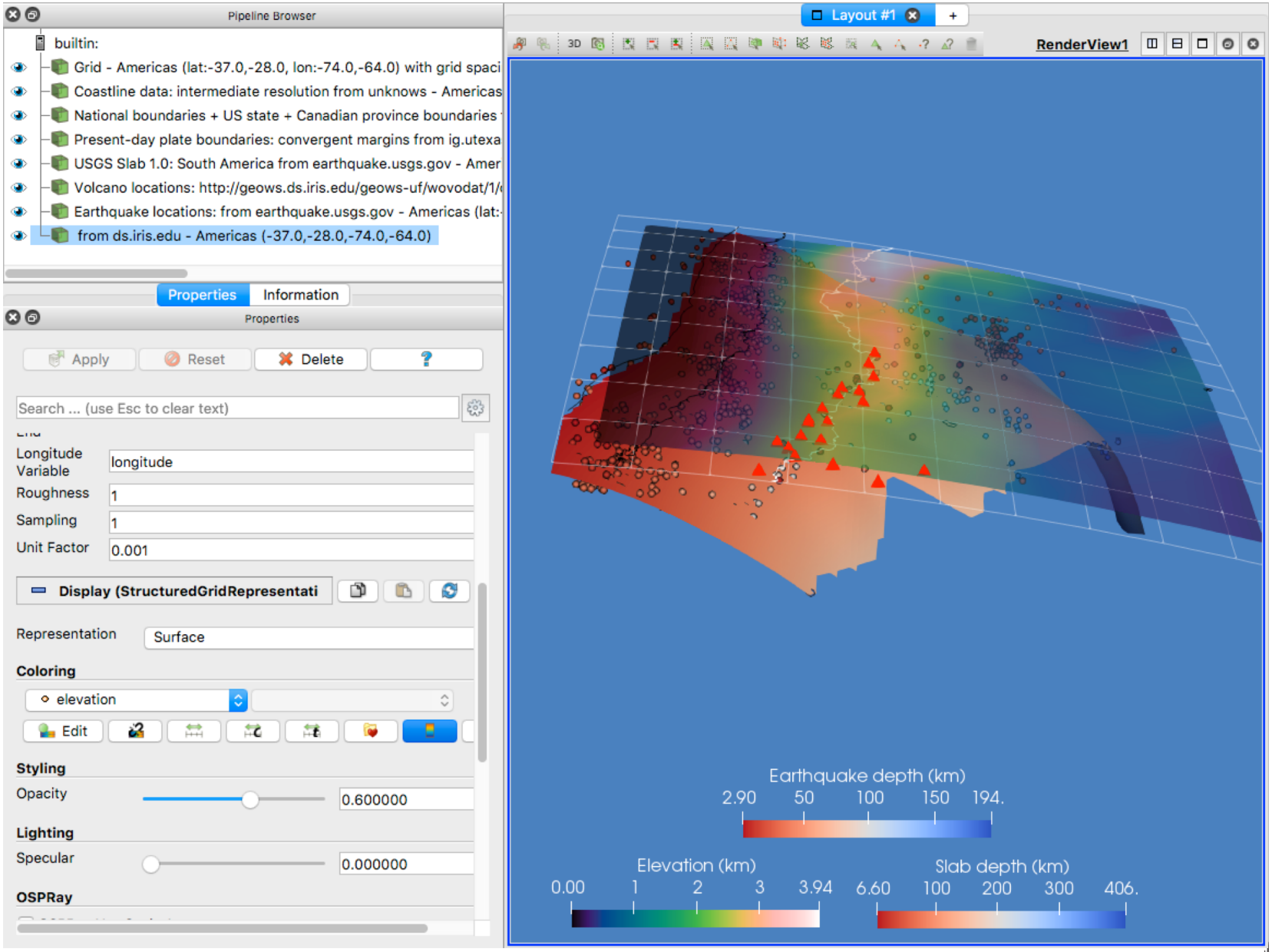
- For more color palettes to choose from, click on the configuration button of the `Choose Preset` window.







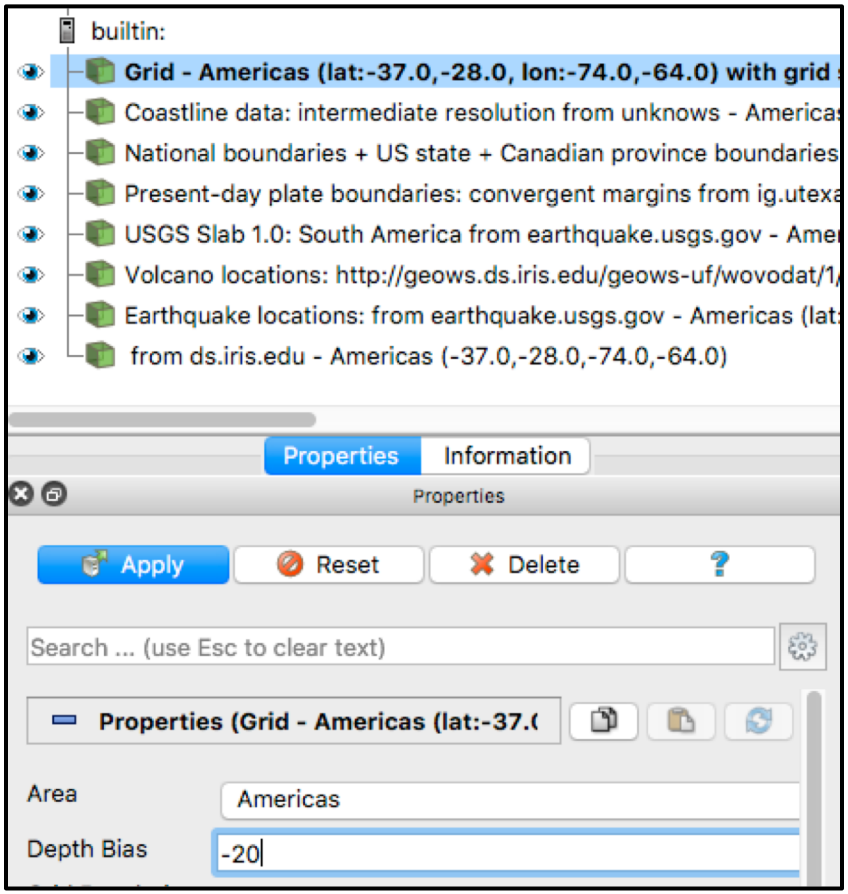
Add Elevation Data



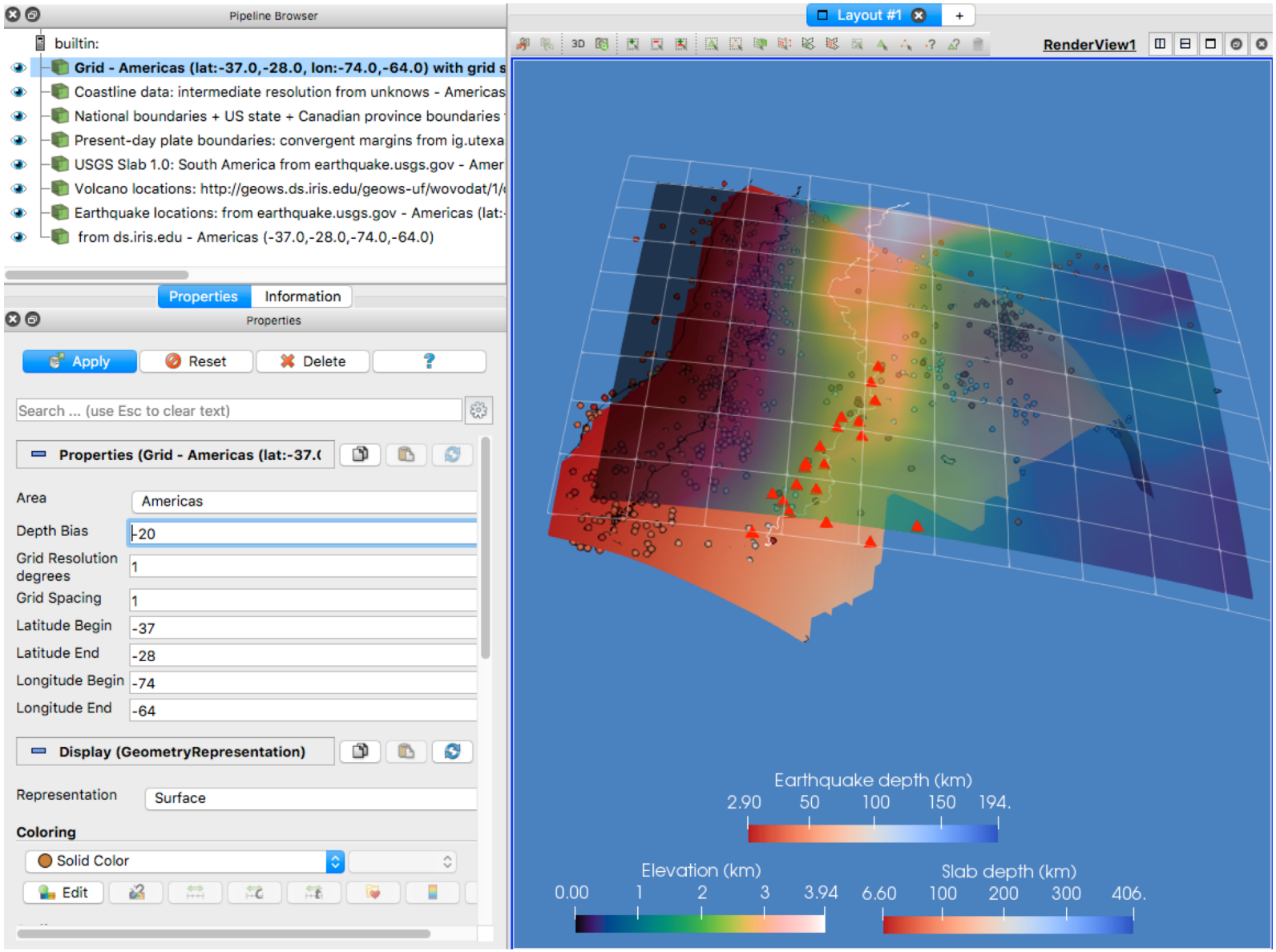
Moving Objects up or Down

The following adjustment will improve the plot by moving the grid lines up so they would be more visible

- Select the Grid object in the Pipeline
- Set the `Depth Bias` to -20 (positive depth is down)
- Click `Apply`



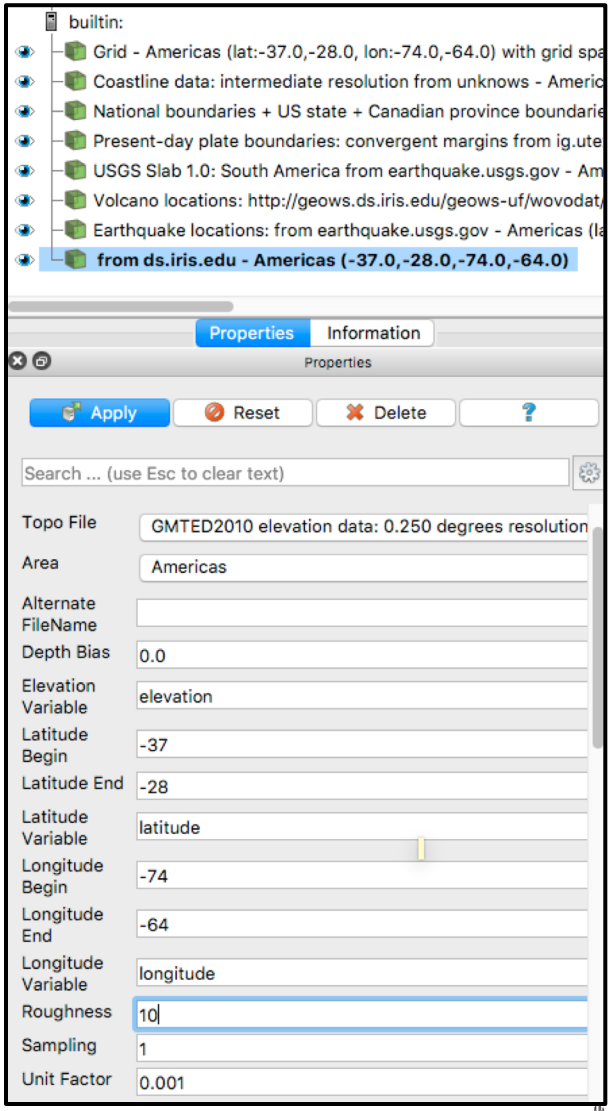
Moving Objects up or Down



Changing Vertical Exaggeration

Increase the resolution and the vertical exaggeration of the elevation data so we can see the topographic relief:

- Select the elevation data object in the Pipeline
- Set the `Topo File` to a higher resolution file
- Increase the `Roughness` to increase the vertical exaggeration
- Click `Apply`



Changing Vertical Exaggeration