

Complex Scene | **Bergen Norway** | Breakdown

Rendering Statistics

Render : Arnold

Avg. Render Time : 5 min / frame

Image Resolution : 1280 x 720

Number of Lights : 2 (Environment & Sun)

Sampling

Camera AA:3

Diffuse :2

Specular:2

SSS:2

Transmission:2

Volume Direct:2

Project Description

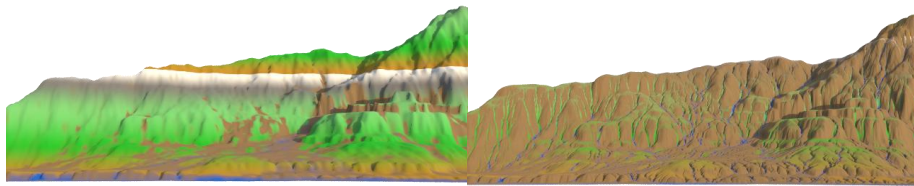
This project is mainly about procedural landscape creation using Height Field, Copy, and Instance nodes. All process done in Houdini including the tree assets creation(SideFX Labs).

The reference is the landscape image from Bergen, Norway.

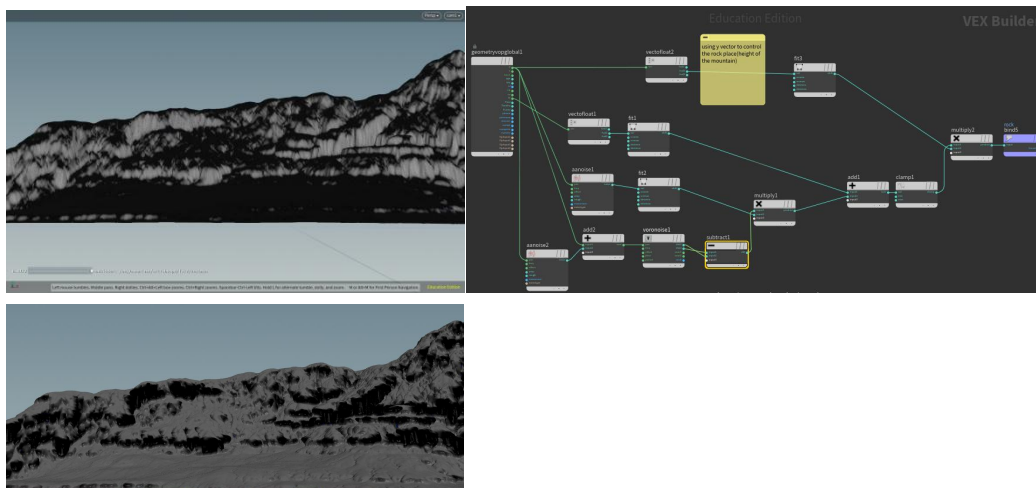
Process

Terrain

For the terrain shape I did several times modification and erosion to make it closer than the reference.



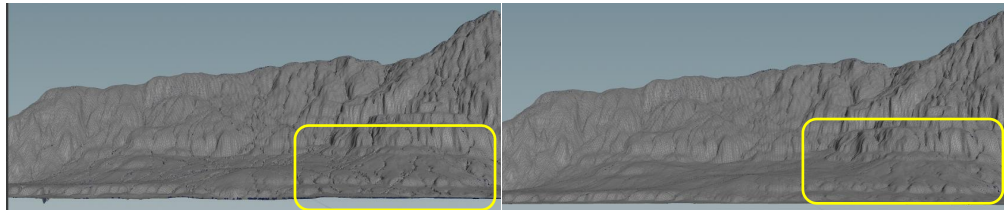
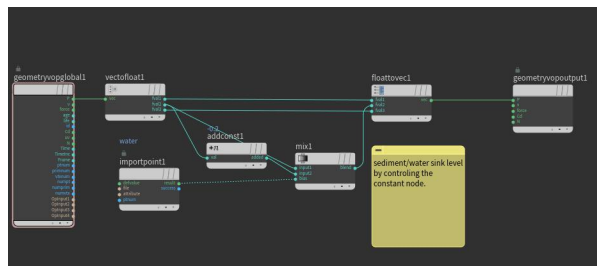
I used Attribute VOP to generate different masks for scattering and texturing.



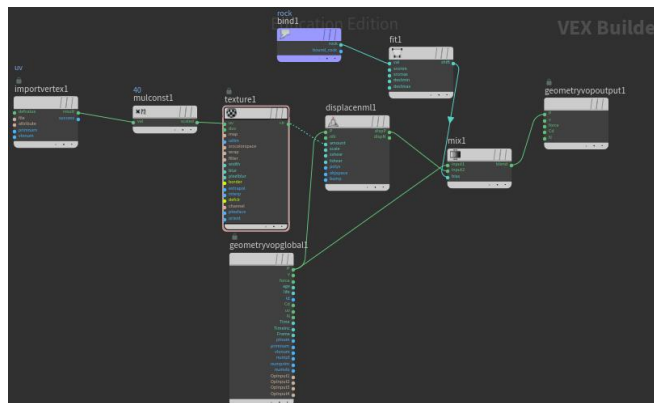
(Example: Rocks Mask & Tree Scattering Mask)

The attribute VOP also can be used for the modification of displacement shape. For example. I imported the point attribute named “sediments” which generated in the erode simulation, than mixed with a constant, this constant can control the sink level of water and sediments. (I used vector to float & float to vector node to transfer the data type. If I wanna control the height of the mask, it also worked if I using vector to float node

to read the Y channel information of position.)



(Example: the constant value from -0.2 to -5)

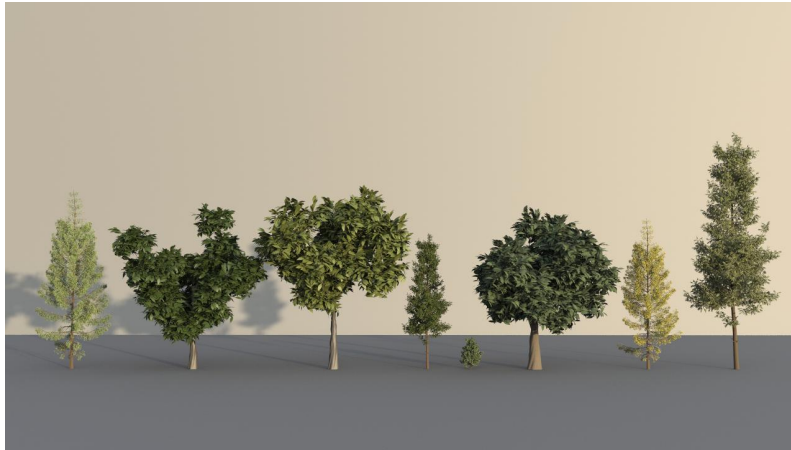


(Example: using texturing map and displacement nodes to generate rocks)

After modifying the final shape of terrain, I used Boolean node to reduce the unnecessary geometry.

Assets Preparation

All trees are created in Houdini Side FX Labs. The main sorts of tree I made are the pine trees and umbrella trees.



Houses are procedural which allowed me to modify different parameters and exported them.

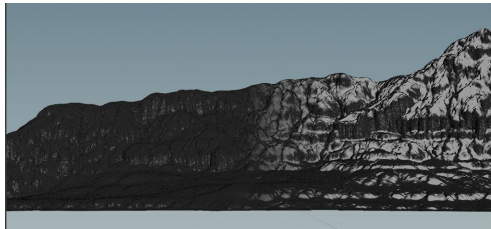
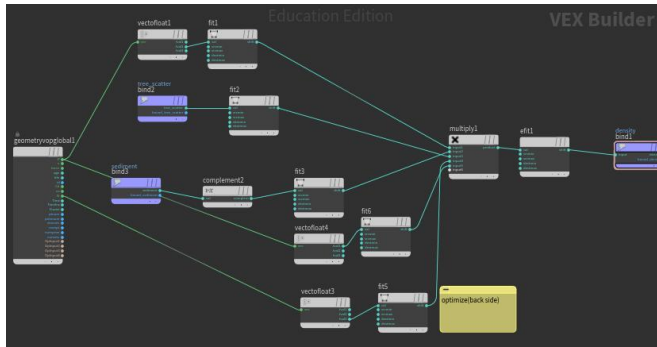
Scattering

For the scattering, I used different ways including **instance** node and **copy to points** nodes.

For the houses I used copy node to do the color variation. (using attribadjustinteger node to give each point a random integer and using attribute wrangle to control the color exactly.)



| | P[x] | P[y] | P[z] | color | house | pscale |
|---|--------|---------|-------|-------|-------|----------|
| 0 | -380.0 | 9.59854 | 372.0 | 0 | 0 | 0.541723 |
| 1 | -349.4 | 9.59854 | 372.0 | 2 | 1 | 0.500293 |
| 2 | -318.8 | 9.59854 | 372.0 | 0 | 1 | 0.581343 |
| 3 | -288.2 | 9.59854 | 372.0 | 0 | 0 | 0.526238 |
| 4 | -257.6 | 9.59854 | 372.0 | 1 | 1 | 0.500225 |
| 5 | -227.0 | 9.59854 | 372.0 | 1 | 1 | 0.518949 |



(density masks of pine trees)

For the trees I used instance node. To optimize the tree scattering, I also used vector to float node, connect it to the N channel, by controlling the Z Channel to make the points on the back side disappear. In the same way, X and Y channel can also be used to control the height and position of points.

```

VEXpression
1 s@instance = "/obj/pine_"+itoc(@ptnum$5);
2
3 f@minscale = ch("minscale");
4 f@maxscale = ch("maxscale");
5
6 f@maxrot = ch("maxrot");
7 f@minrot = ch("minrot");
8
9 @pscale = fit01(rand(@ptnum),@minscale,@maxscale);
10 @orient.y = fit01(rand(@ptnum),@minrot,@maxrot);

```

Attributes to Create

Enforce Prototypes

| | |
|----------|-----|
| Minscale | 0.2 |
| Maxscale | 0.4 |
| Maxrot | 1 |
| Minrot | -1 |

In the instance layer, I added one attribute wrangle to do the Size & Rot variation of each points.

ACES color space (COP)

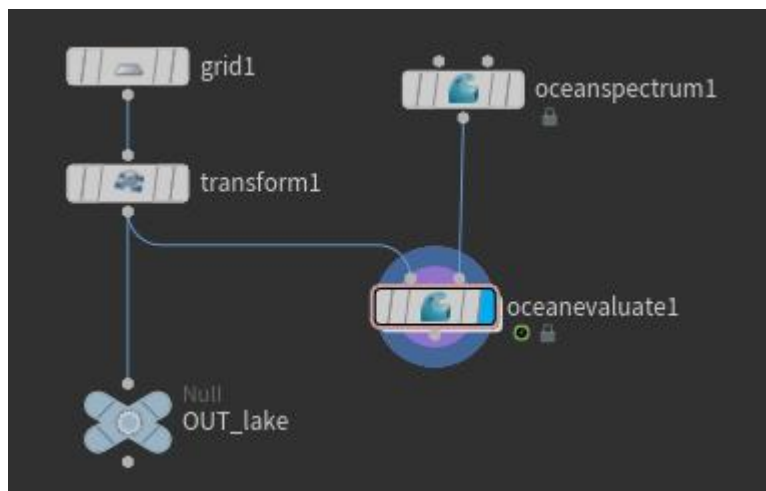
In this project I wanted to try using acs config to work, so I downloaded the config and import it by modifying the environment variable. This was the first step, then I converted all SRGB images(including HDRI and texturing maps) to the ACES-CG color space to make

sure the output is correct.



Lake

To create the lake I used oceanspectrum and oceanevaluate nodes to do the water shape and simple animation.



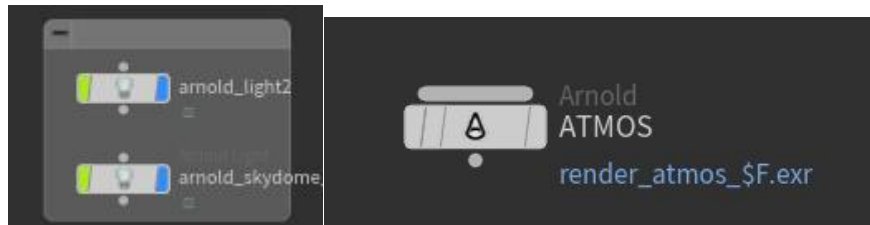
Color Ramp of the trees

I did color ramp on the tree shader so that the colors of trees will have change rather than keeping one constant color.



Final Update

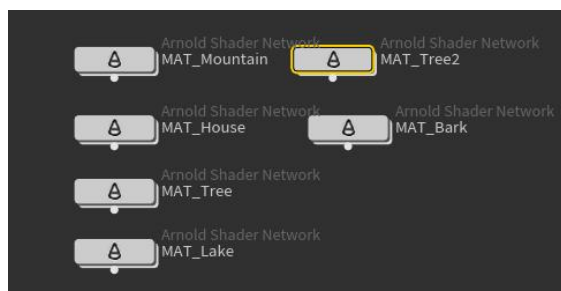
1. Change the render from Mantra to Arnold
2. Add Atmosphere lighting bundle



| Name | Size |
|------|------|
| ENV | 2 |



3. Arnold materials network



4. Scene Extension

