

River Auto Material: <https://www.assetstore.unity3d.com/#!/content/101205?aid=1011IGkb>

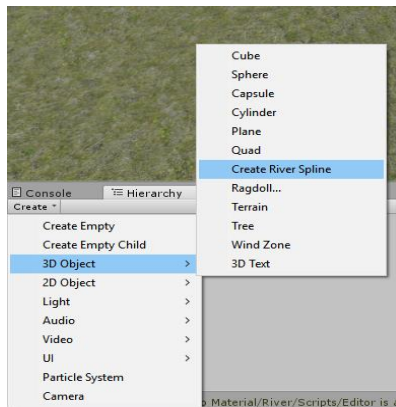


Lava & Volcano Environment: <https://www.assetstore.unity3d.com/#!/content/112703?aid=1011IGkb>

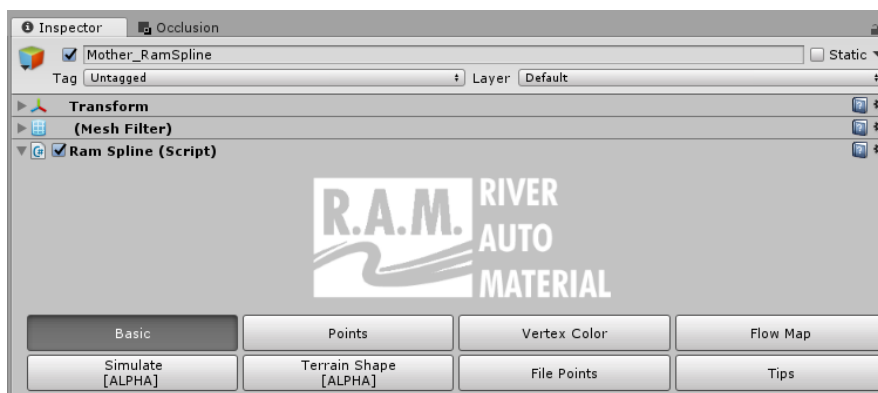


By our spline tool you could create very advanced mesh for your water/lava river or cliff and road. By our vertex paint you could customize meshes and spline in selected places. Here are few steps that will give you ability to create simple mesh for your river:

### 1. Create river object at your scene:



### 2. Check spline object at your scene hierarchy. You will get such view in inspector window.



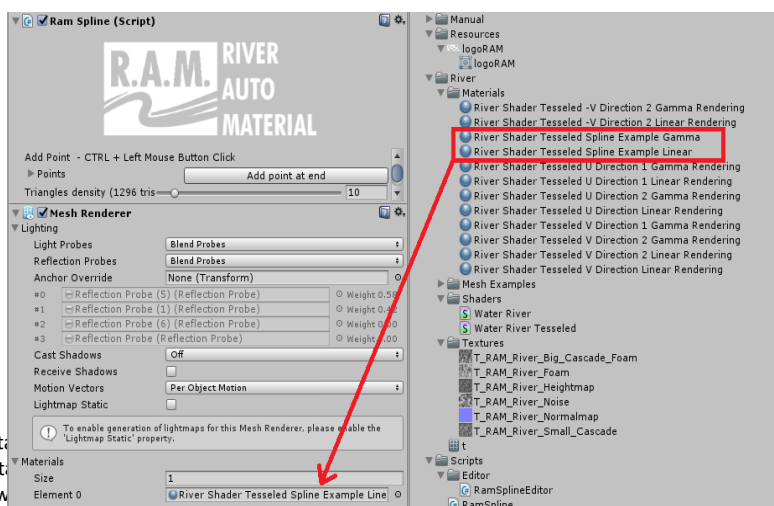
As you see there are few main pages:

- **"Basic"** - changes which are global for whole mesh or even few of them if rivers are connected.
- **"Points"** - local changes like rotation, position, scale, add, remove, select.
- **"Vertex Color"** - modify mesh and customize locally by our vertex color tool if vertex color shader is selected.
- **"Flow Map"** - modify flow map for shaders that support flow direction
- **"Simulate"** - this part allow you to simulate river/spline flow from specific point.
- **"Terrain Shape"** - modify terrain under the spline
- **"File Points"** - here you could import points from CSV file to create R.A.M spline.
- **"Tips"** info about lighting and tricks.

### 3. Add points (raycast from mouse) when you hold CTRL + Left Mouse . Setup few points like that.

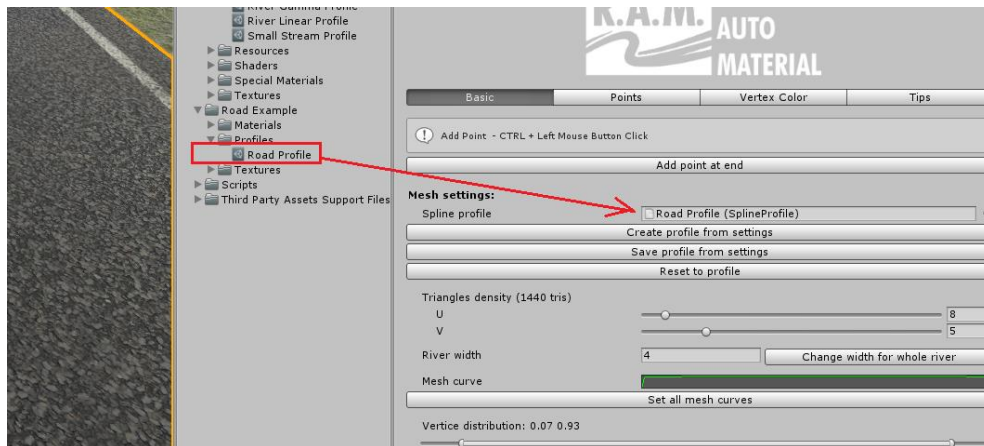
### 4. To setup your material into river you can do this in few ways.

- You could drag and drop it from our library or create your own. Just drag and drop material from project into mesh renderer component



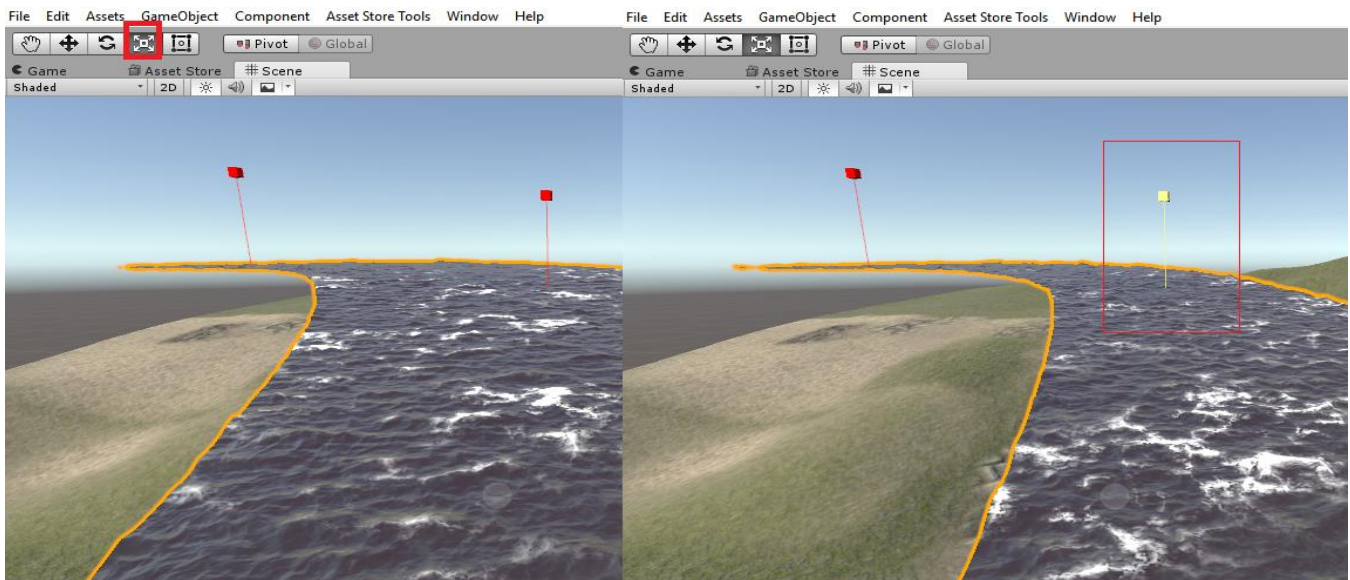


- You could drag and drop profiles which contain info about material, mesh shape, spline resolution. Try our river and road profiles. It's very useful, you don't have to copy paste any values anymore to create similar effects.

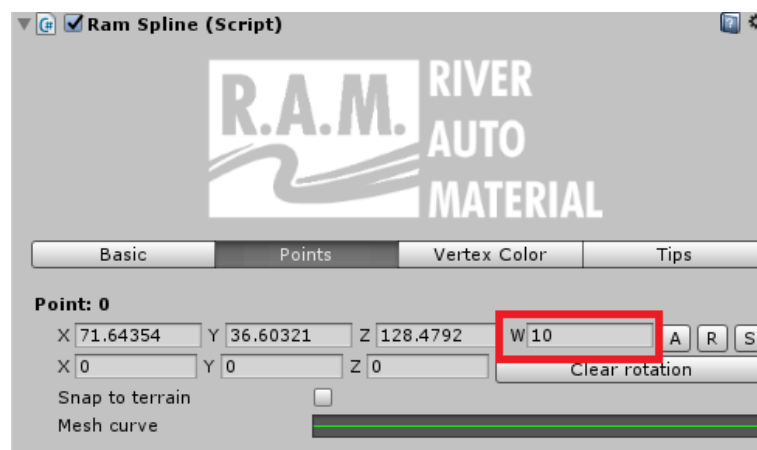


### 5.Scale mesh.

You could start scaling your river in specific point by clicking "R" or by this marked button. During moving the box up or down at your screen, river will get different scale at selected point.

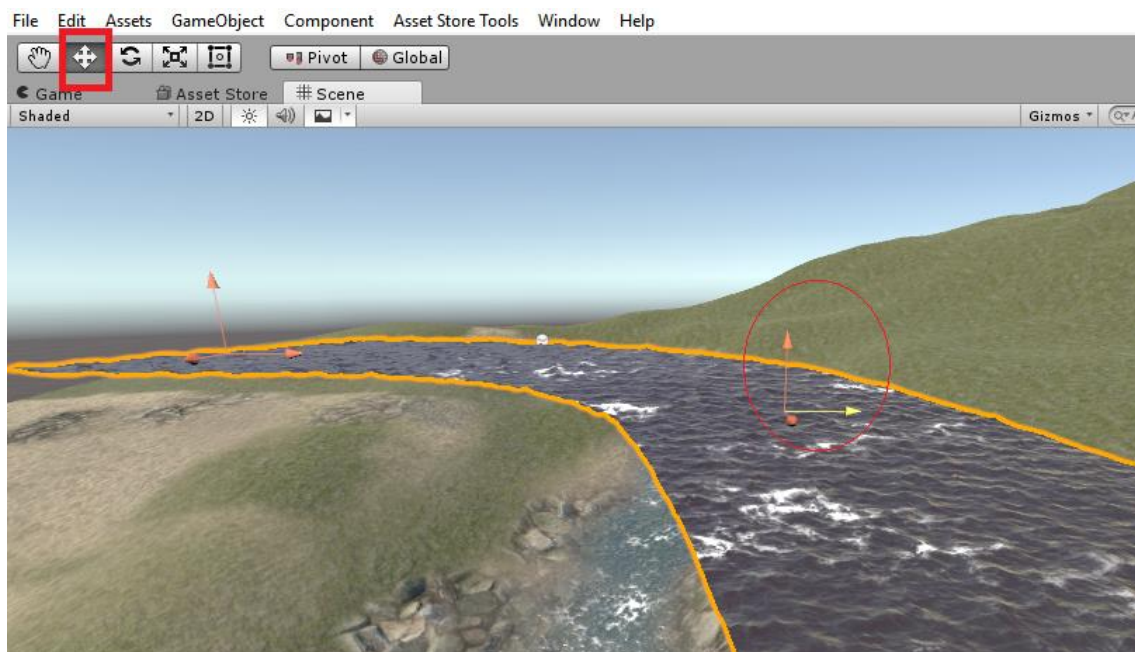


You could also scale river in specific place in Points page – “W” value



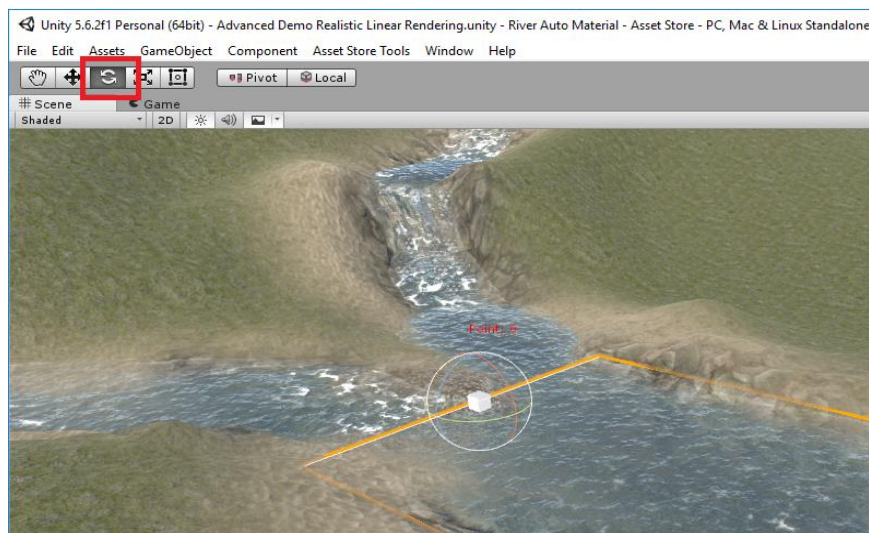
## 6. Point move.

You could start to move your river specific points by clicking "W" or by this marked button. By moving selected arrow at your screen river point will change point position.

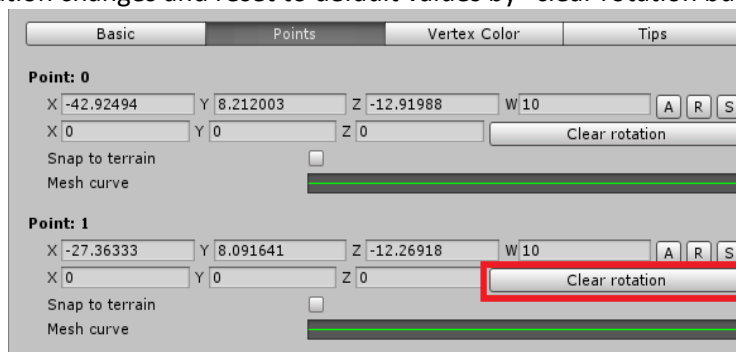


## 7. Rotation

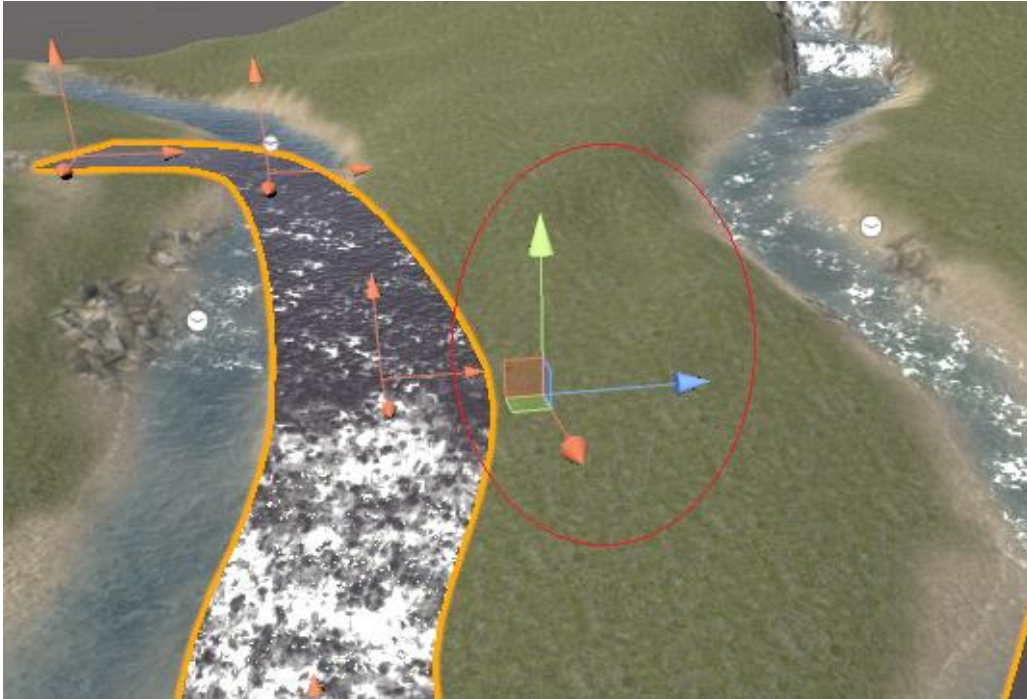
You could rotate points at river like normal objects in scene hierarchy. Click "R" or marked this button. Note that too big angle sometimes could invert normal but small changes could fix spline or add additional details. By green and blue lines you could control shape, by red mesh normal direction. Via mesh normal direction you could create cascade even at flat area or adjust it before or after cascade. We advise to play with it a bit!



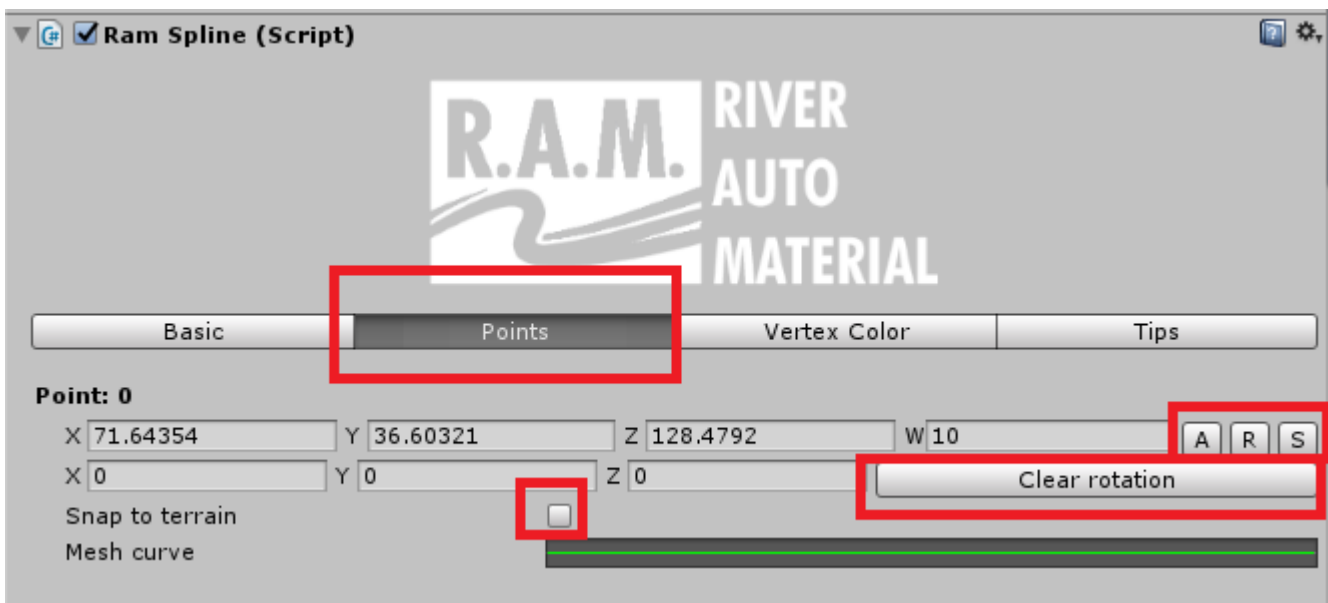
You could always clear rotation changes and reset to default values by "clear rotation button" in points page.



8. You could move whole river by selecting big object arrow.



9. Additional point options in points page:



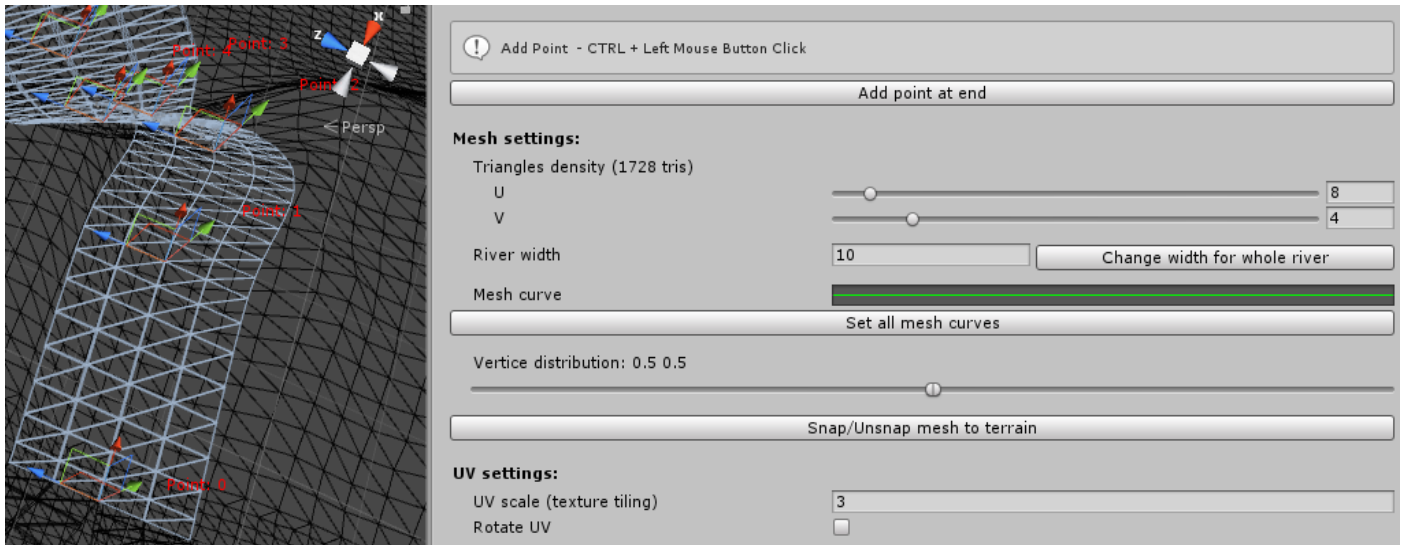
- "R" button to remove points from spline.
- "A" button to add point after this selected point.
- "S" button to select "mark" point at spline. Helpful before remove operation.
- "Clear Rotation" will reset rotation in current point to default values
- "Snap to terrain" your mesh ( mesh will follow the terrain in current spline point), useful for streams and in other objects then river, our tool is universal.
- "Mesh curve" allows you to change locally mesh shape in current point. Useful rather for roads or small streams in combination with "Snap to terrain" To get more visible changes you have to change mesh distribution in "Basic" page.





## 10. Mesh resolution.

You could control it by changing triangle density number in U or V direction. From our perspective 4-8 is pretty good value. You could add more triangles in specific area by adding more control points instead of adding them globally by this slider. If you connect few rivers you also have to keep a bit more verts in V value to distribute to other rivers. Note that if you have multiple rivers connected this option will be switched off for rivers which are connected with main river. More info you will find lower. Anyway just play with it.



**Note:** For tessellated shader it's good to hold pretty square mesh because of equal triangles. Ofc do not add V density too much. Tessellation will handle non square mesh but when difference is too huge it could start to look weird. In close distance tessellation will handle and fix most mesh problems with river shape so there is no need to adding huge density in the mesh – trust tessellation ☺

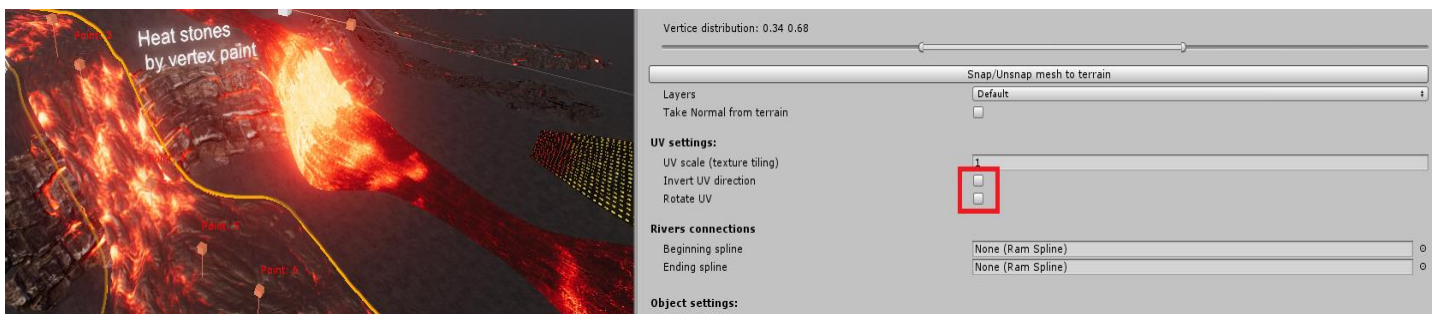
## 11. Mesh split.

You could split river into many submeshes. It's useful for streaming, long rivers parts camera culling and for reflections. Simply check the box and chose how many submeshes you want to have. This option will be extended so you will be able to cut river in every specific point.



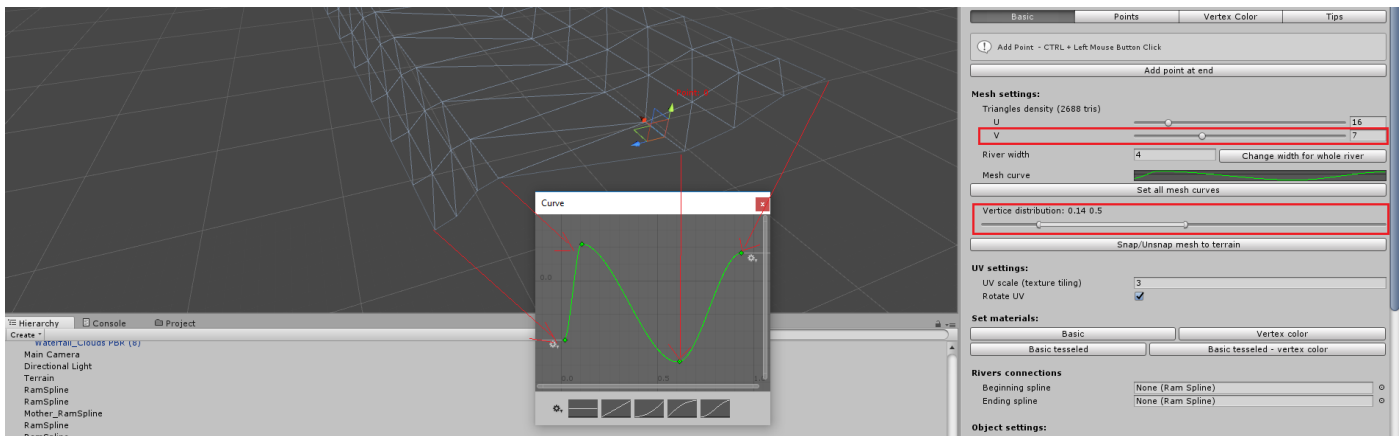
## 12. UV settings

UV control gives ability to change tiling of the river or rotate whole UV by 90 degrees. Our realistic material use non-rotated uv. This option was added to support textures with different directions. UV scale could be switched off if river depend from other rivers (multiple river connections) . You could also invert river direction.



### 13. Mesh curve and vert distribution.

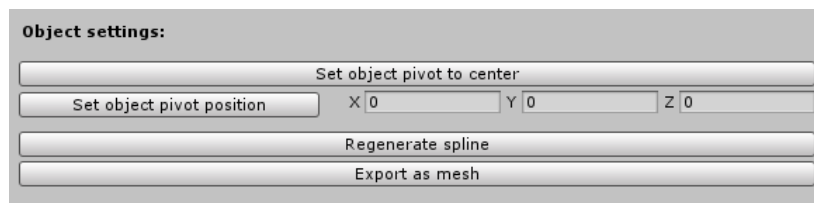
This options allow to change mesh shape and vertex position. Anyway this need a bit more V density. Take a look at this configuration:



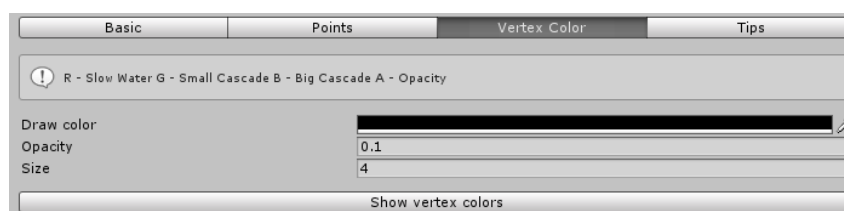
We moved vertex density into left side of the mesh and we change shape globally by curve. You could change this shape also locally in "Points" setting.

### 14. In object settings you could:

- change river object pivot position to its center or specific position.
- export it into unity asset instead of editable spline object.
- regenerate mesh object if you need. For example after copy/paste into other scene or multiple rivers changes/refreshing. It sometimes helps.



### 15. About vertex color:



- When you start playing with vertex color you have to choose vertex color shader variant.
- Each color/mask give ability to paint by different water stage.
- Different surface react on their own way on vertex paint:

#### Lava:

- R - Pretty cold lava/small slope
- G - Hot lava/bigger slope
- B - Very hot/waterfall
- A - Frozen lava

#### Lava Frozen:

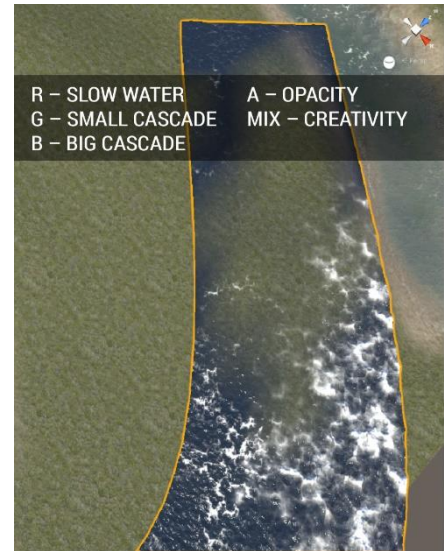
- R – Heat your lava
- G – Cover your lava by ground texture or any other
- B – maybe we will add another 2<sup>nd</sup> ground texture



- A – we will see 😊

Water:

- R – Slow water
- G – Small cascade
- B – Waterfall
- A – Alpha color It's useful to blend with other water systems or paint specific behave in specific place.



## 16. Multiple river connections

Best practice is to watch our video tutorial with our demo scene then try to do it yourself. Basically you have to prepare yourself for this operation. Because there is few rules which have to be hold to get good synced mesh. For non-tesseled shaders you don't have to keep them all because vertex offset will not desync and destroy mesh at connections.

- If you create 2 rivers connections and they will become 3<sup>rd</sup> you have to drag and drop 3<sup>rd</sup> river as end of 1<sup>st</sup> and 2<sup>nd</sup> and adjust how big part of new river is 1<sup>st</sup> and 2<sup>nd</sup> river by "Part parent" slider.



This 3<sup>rd</sup> river will now control "V" mesh density of your 1<sup>st</sup> and 2<sup>nd</sup> river and tiling. We did this to create seamless connection between rivers even with tesseled shader. Look at V and UV settings at 1<sup>st</sup> river. They were grayed.

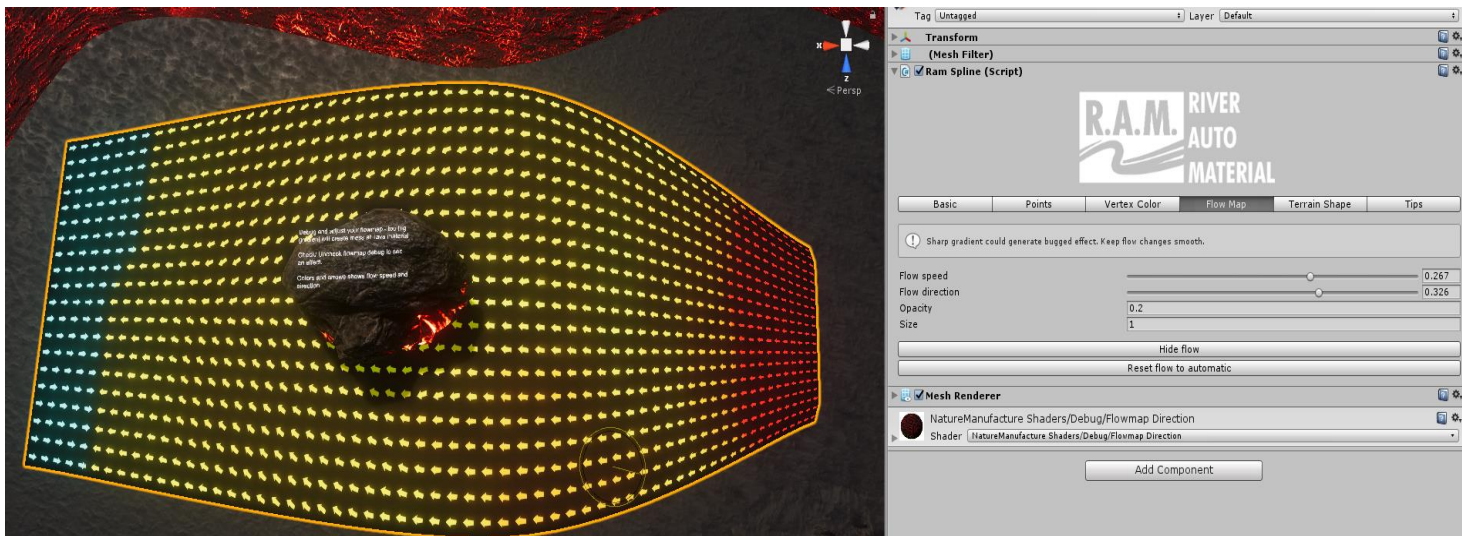
- If 1<sup>st</sup> river become 2<sup>nd</sup> and 3<sup>rd</sup> river you have to connect 2<sup>nd</sup> and 3<sup>rd</sup> river into mother "1<sup>st</sup> river" at beginning spline window. You also have to adjust how big part of the old river is the new one. In this case mother river will also control 1<sup>st</sup> and 2<sup>nd</sup> "V" mesh density. Anyway look in our example this 2<sup>nd</sup> river is also connected to another river in ending spline window. Bigger constructions are also allowed.





In such case you could create connection of 2,3,4,5 rivers at the same place but... each river take 1 or more "V" resolution. If mother river have v resolution = 4 you could create 2 rivers with V=2 and V=2 like at the image or V=3 and V=1. Play with it and check our complicated example in our demo scenes. We will add more info about this soon and show how awesome it could be.

## 17. Flow Map



Flow mapped shaders are very sensitive. Gradient between direction must be smooth, mostly in tessellation shaders where verts must smoothly change UV and direction. We gives to debugs.

- Show flow directions - Arrows with colors which shows direction and speed of water. Deep red or blue mean big speed. Be careful and blend speed, don't create big gradient.
- Show flow smoothness – used to debug flow on connections between multiple rives. If you will see hard gradient there, try to move a bit mother river it will blend flow in connected rivers.

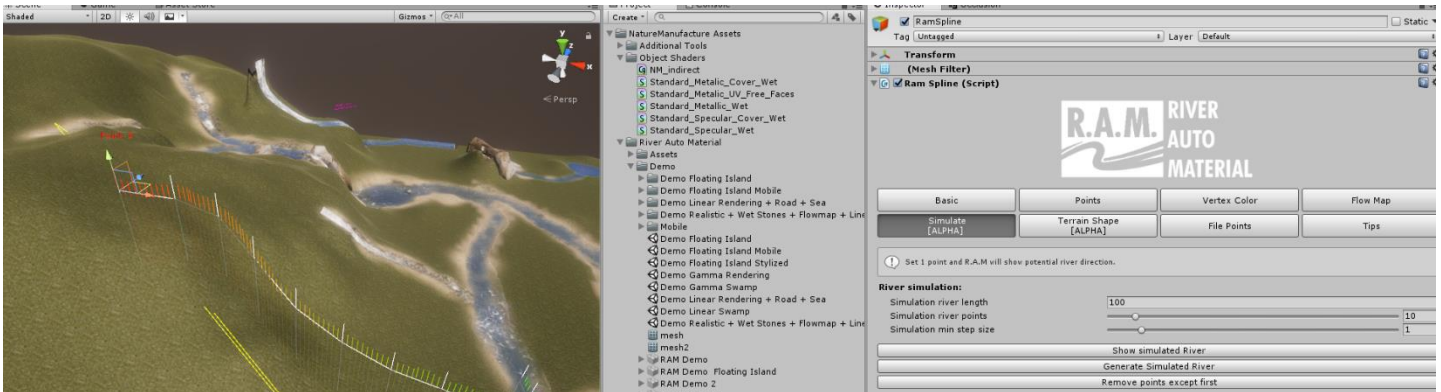
### Note!!

In next version we will add flow painting on multiple rivers at the same time. Until now you have to carefully blend flow on river connections or leave this as it is – it will work fine and natural on automatic mode. Flow mapping need a bit more love from our side. We will upgrade it many times.



## 18. Simulate (Alpha)

This new options is useful to simulate river behave. User **setup only one** point, chose river length, density of points. Click “Show simulated river” to check how river will behave and which direction will chose. R.A.M will analyse shapes around and show potential river position. It’s useful for natural river generation. If shape of spline and it’s position fit you, simply click generate. With our upgraded terrain shaping you will be able to setup whole river in 3 buttons click with whole bed. This kind of simulation will chose most accurate and natural river bed. If you want to repeat, operation click remove points except first to start simulation again from 0. This is our first but not last procedural option. We will extend this area a lot in upcoming updates.



## 19. Terrain Shape (Alpha)

This is early tool to shape terrain around spline. It works on multiple terrains and it could create river bed or road hill. We will focus on this as well at next releases to save your time.

With this system you create shape of the river in curve editor and you are able to visualize it, adjust shape depth, offsets and terrain influence distance.

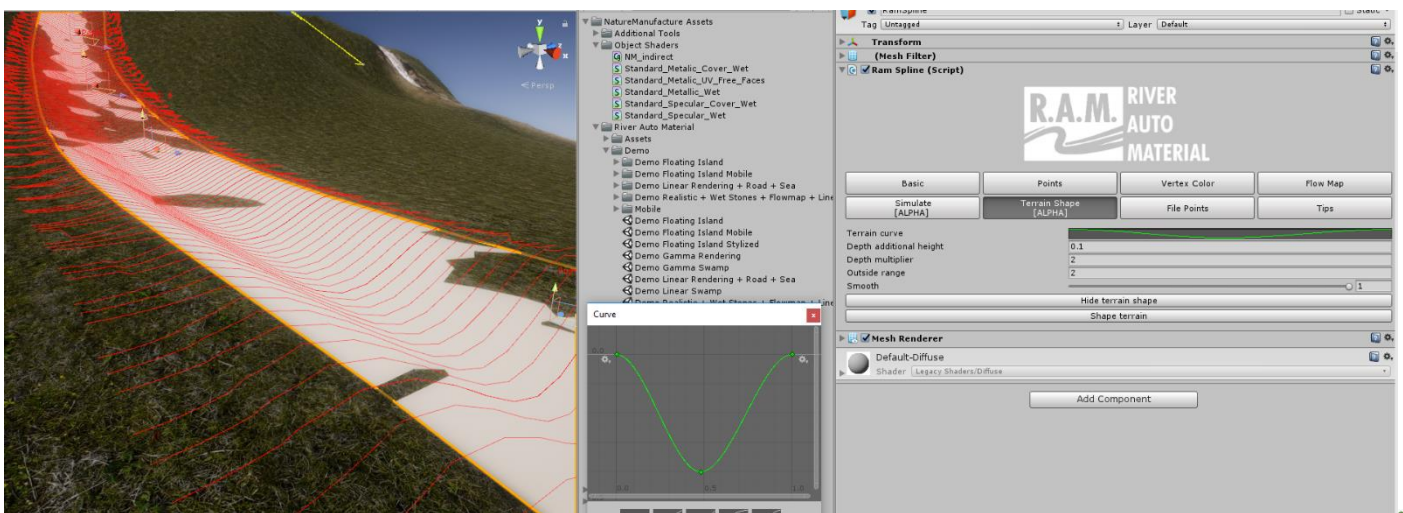
“**Depth additional height**” – this option allow to add offset, useful for roads or river borders blend.

“**Depth multiplier**” – allows you to multiply depth of the curve.

“**Outside range**” – allows you to check how big influence river should have on terrain around spline.

“**Smooth**” – you can adjust smooth power for terrain shaping.

It’s early version still, there is **no undo** at the moment.

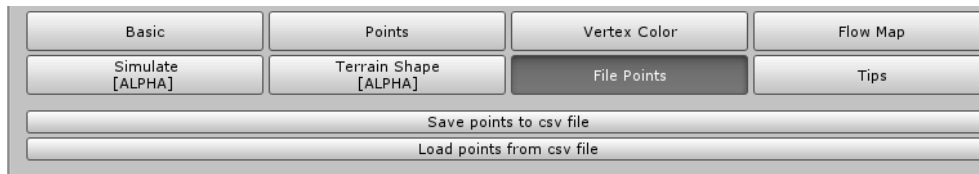




## 20. File Points

This option allows you to import and create splines from CSV file format. Useful if you want to import data from GIS, and other 3d programs then unity.

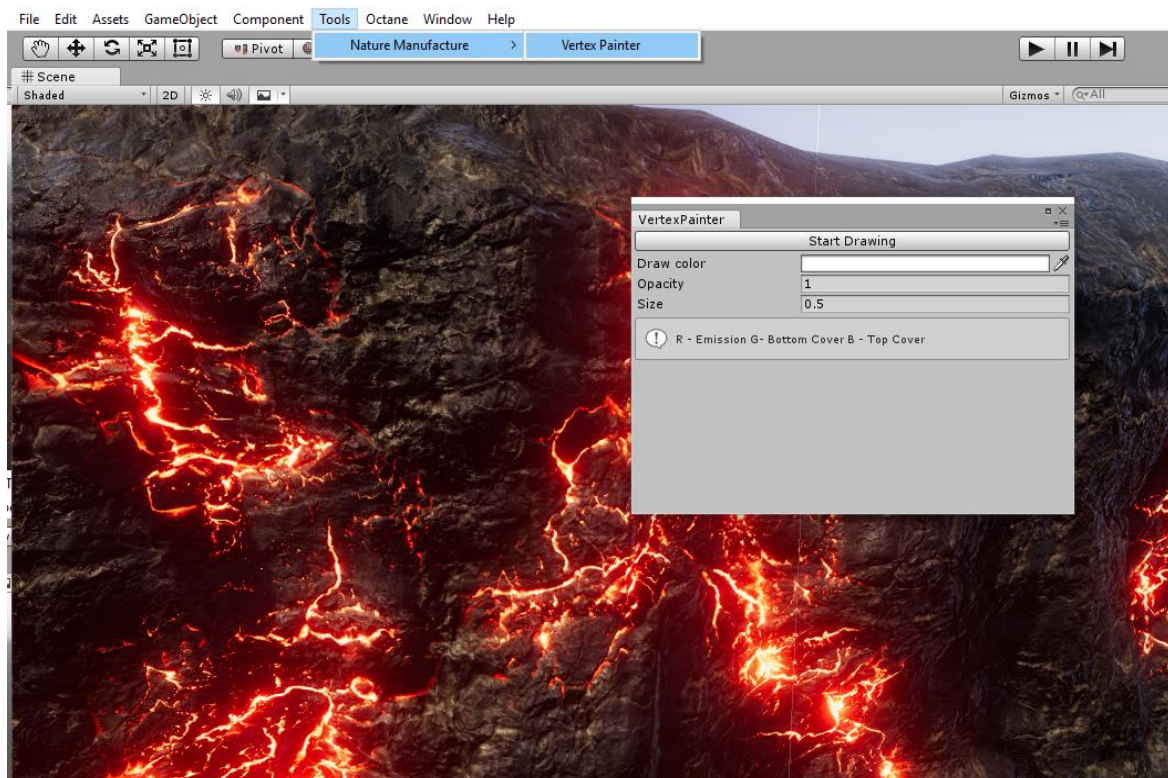
You could always export spline from unity into file in CSV format.



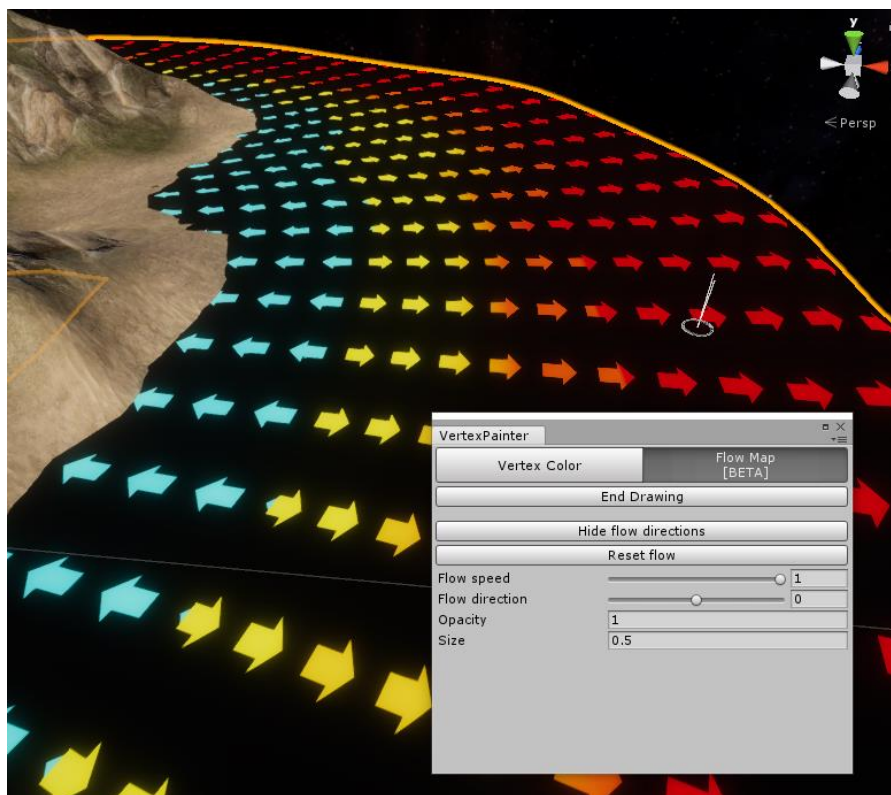
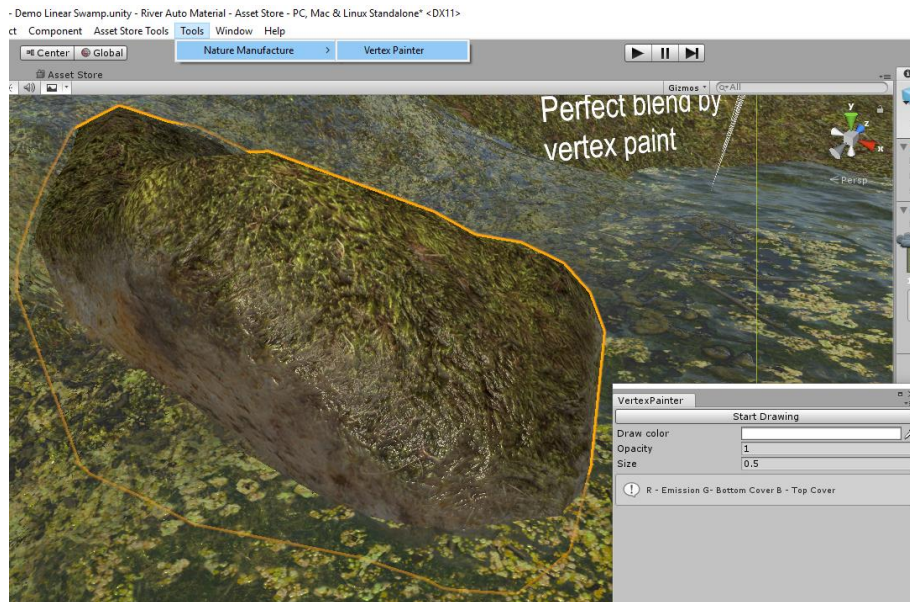
## 21. Vertex Painter (Beta)

This early version of tool give ability to paint on vertex and UV to get additional effect. In river it will make rocks wet, but in lava it will heat stone or even overlay it by chosen textures like rocks or sand. By uv painting you could paint flowmap on models. R.A.M spline mesh should be painted via spline tools, for all other meshes this tool will be best.

- Default color is white – no actions. By decreasing color power R,G or B it starts to shows effects in our shaders.
- We choose white because shader must work without any effects on default white meshes too.
- **Always check mother** (object with LOD group) to paint on every LOD at the same time. If you will check only LOD\_0 etc only this lod will be modified. Rest will be untouched. For small changes its pretty cool to leave last LOD untouched to save GPU and memory. You always could paint on all LOD's and at the end change/reset last LOD mesh to default.
- We added flowmap painter which works exactly the same as at spline river. Flowmap painter on meshes was used in our floating island demo.







We will improve it every update but.. you also could use own vertex paint tools to play with our shaders.

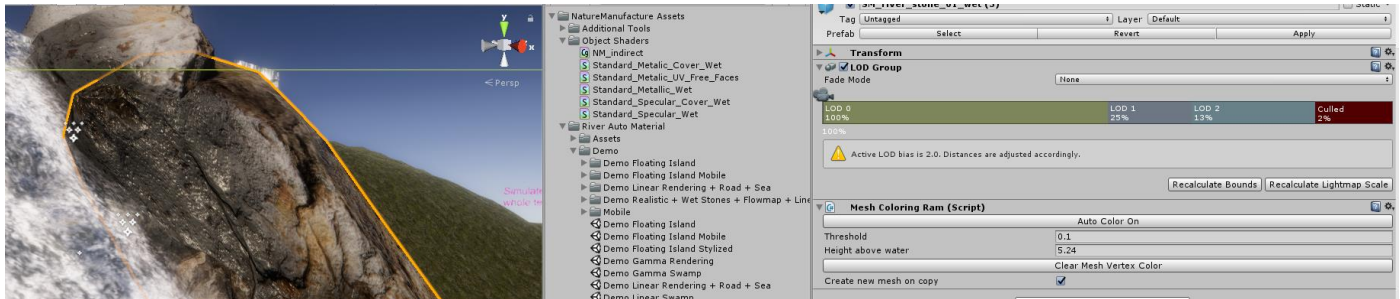


## 22. Automatic rocks heating and wetness.

Simply drag and drop our Mesh Coloring Ram script into object, LOD parent. It will detect R.A.M and make stones wet by water or heated by lava.

**“Threshold and Height above water”** – this 2 values are used to adjust blending between wet and dry surface.

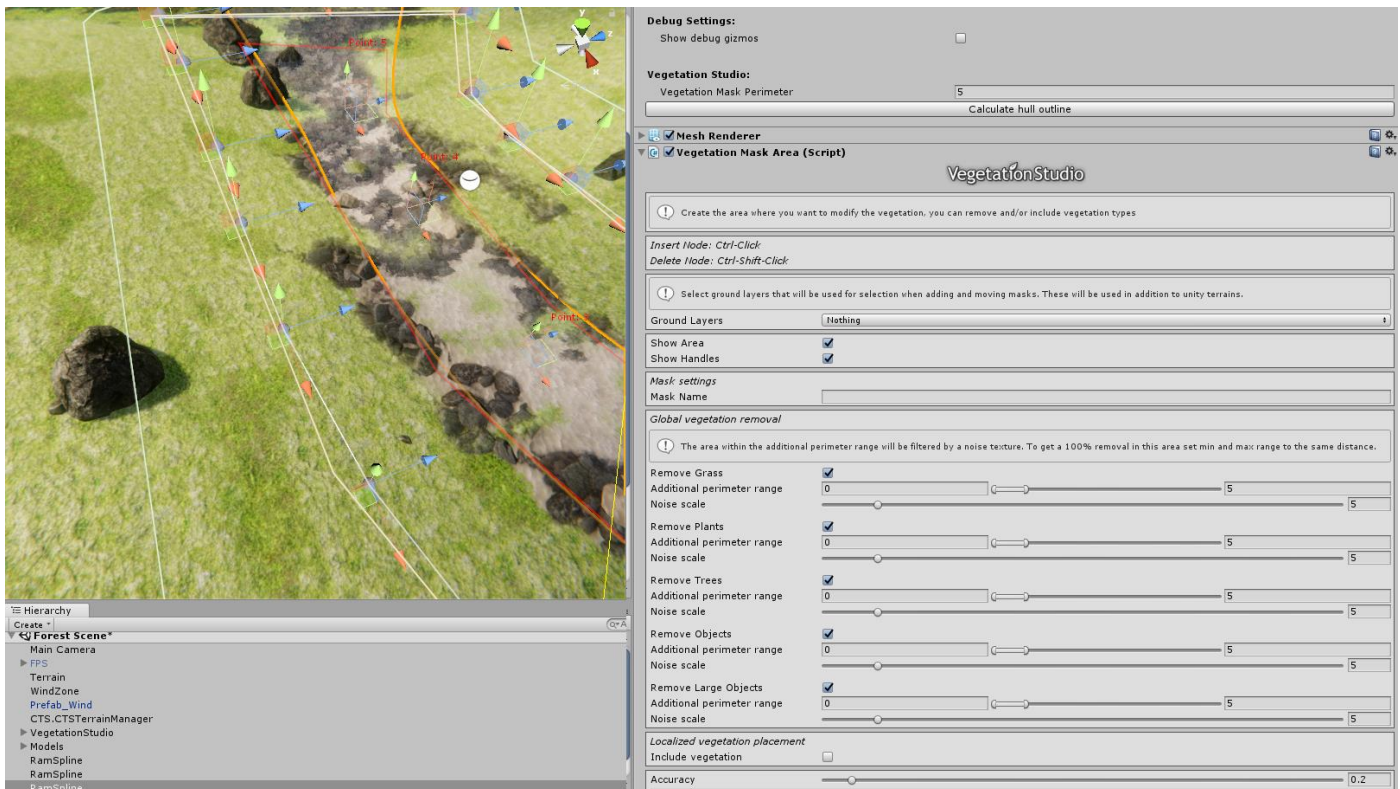
**“Create new mesh on copy”** gives ability to copy this mesh many times without overwrite the data.



## 23. Vegetation Studio Support.

Asset support vegetation studio and vegetation studio pro versions. R.A.M will detect VS out of the box in your project and show additional option in “Basic” page at the bottom.

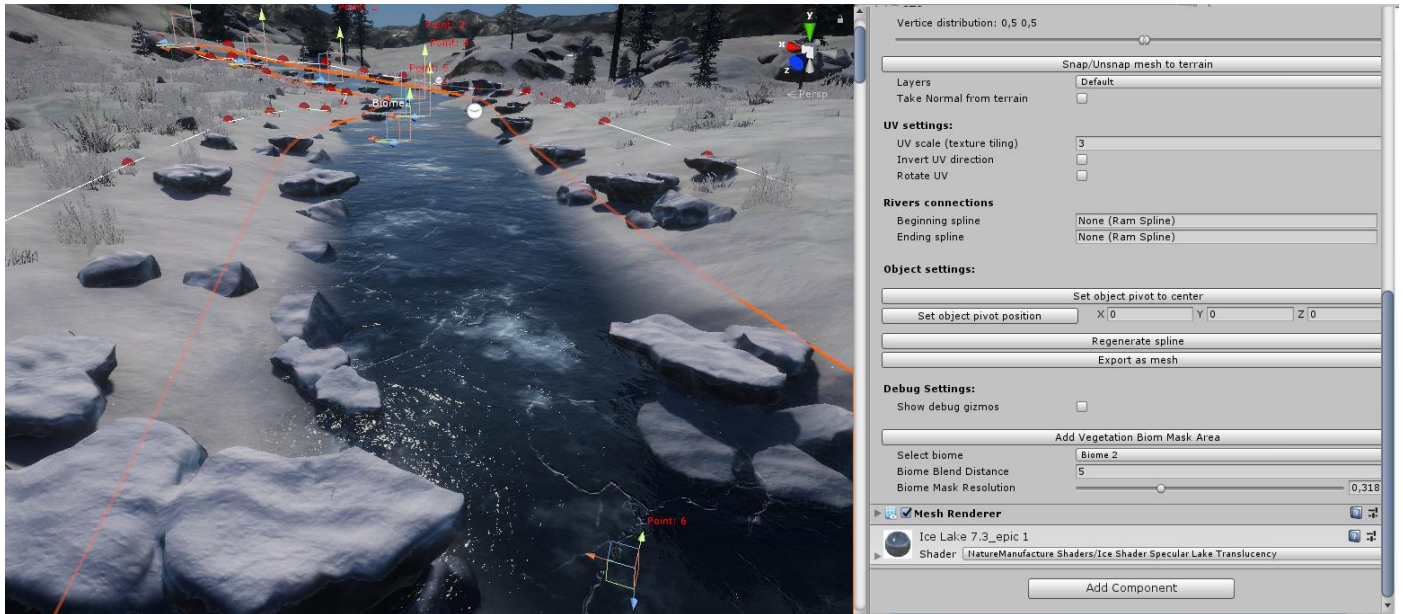
**Standard Vegetation Studio** it will cut foliage around the spline.





**Vegetation Studio Pro** it's could be biome object like in first Lennart biome video presentation. We made there: Frozen river biome, water river biome, lava river biome. In this pack you could find example biomes for VS PRO beta. Ofc they could be broken because VS PRO is in development, we will keep this up to date as we can. In biomes we mixed our assets so to support our biome profiles you probably need most assets. We share our examples, give us feedback.

At image below we spawn ice floe around the frozen river, everything is procedural, no single object at this scene at all.



## 24. Small API.

**CreateSpline(Material splineMaterial = null, List<Vector4> positions = null)** - Creates spline with points

**AddPoint(Vector4 position)** - Adds point at end of spline

**AddPointAfter(int i)** - Adds point in the middle of the spline

**ChangePointPosition(int i, Vector3 position)**

**ChangePointPosition(int i, Vector4 position)** -

Changes point position, if new position doesn't have width old width will be taken

**RemovePoint(int i)** - Removes point in spline

**RemovePoints(int fromID = -1)** - Removes points from point id forward

