AQUAS

WATER/RIVER SET
DOCUMENTATION

BASED ON AQUAS VERSION 1.3

Table of contents

1.   Introduction

Thank you for purchasing AQUAS! This documentation has been written to give you a detailed overview of the asset. AQUAS is a set of water shaders for all kinds of environments and performance levels. It is aimed to be as flexible and customizable as possible, while keeping the performance impact as low as possible.

In this manual you will learn how AQUAS works and how to set it up properly. It covers the most common setups to keep setup as quick and simple as possible. Of course no manual can cover every eventuality, so if you need a setup that isn't described in this documentation, please head over to the **Forum Thread** and leave a post.

2.   Quick Setup

1. Import AQUAS

2. Open the Quick Setup window

–   Under "Window" => "AQUAS" => "Quick Setup"

3. Add water to the scene

–   Make sure to have a terrain in the scene (required for quick setup)

–   Drag the terrain gameobject and drop it on the Terrain field in the Quick Setup window

–   Drag the camera gameobject and drop it on the camera field in the Quick Setup window

–   Specify a water level

–   Click the "Add Water"-button

4. Add Underwater Effects

–   Click the "Add Underwater Effects Button"

What the quick setup does, is it adds a waterplane to your scene with the triple textured (bumpy) material on it, positions it in the center of your terrain at the height, you've specified as the water level and scales it based on the terrain's size to exceed its bounds. The camera is being equipped with the AQUAS_Camera script, that enables depth rendering in forward, which is required on certain platforms and with certain graphics APIs.

It also adds the caustic projectors as child objects of the waterplane. Adding the underwater effects adds all the components required to the camera, as well as the UnderwaterCameraEffects prefab as a child object of the camera. The underwater effects need borders at the bounds of the terrain to be balte to draw fog underwater, because fog requires surfaces to be drawn on.

Once Water and underwater effects have been added, the water is fully functional in its basic configuration. Please also click the info buttons in the the Quick setup window for additional information and hints.
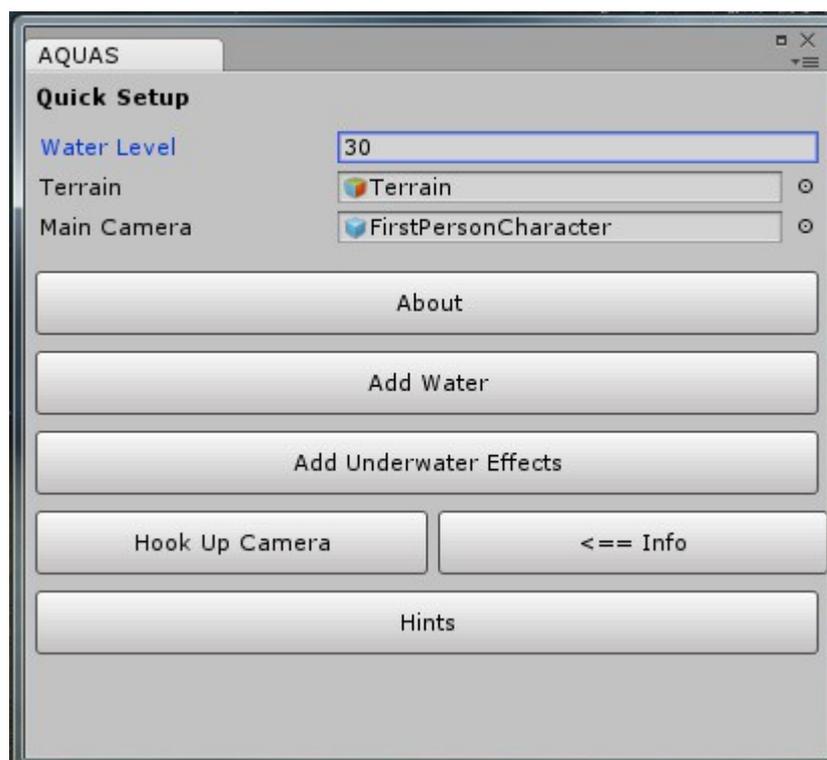
3.   River Setup

1. Import AQUAS

2. Open the River Setup window

– Under "Window" => "AQUAS" => "River Setup"

3. Add water to the scene

– Make sure to have a terrain in the scene (required for river setup)

– Drag the terrain gameobject and drop it on the Terrain field in the River Setup window

– Drag the camera gameobject and drop it on the camera field in the River Setup window

– Specify a water level

– Click the "Add River Plane"-button

4. Create river reference image

– Add the water plane to the "Water Plane" attribute in the River Setup if it hasn't been added automatically

– Click the "Create river referenve image"-Button

– The reference Image will be saved in the folder "RiverReferences". AQUAS will create it, if it doesn't exist.

– Use an external tool like **Flow Map Painter** or Photoshop to create a flow map based on the river reference image and save the flow map somewhere in your "Assets"-folder

5. Add flow map to the river shader

– Select the river plane created

– Drag and drop the newly created flow map to the "Flow Map"-attribute in the plane's material and set the flow speed property as desired (negative values will have the river flow in the opposite direction)

– If working in linear color space, check the box that says "Using Linear Color Space", to make sure, flow maps can be read correctly

6. Add Underwater Effects

– Click the "Add Underwater Effects"-button

The river setup in AQUAS works similar to the quick setup. It adds a water plane to the scene and fits it to the terrain. A major difference here is that the plane added isn't round, but rectangular. It's a standard Unity plane that is being equipped with the river material that comes with AQUAS by default. It's advisable to copy the material and rename it before using, because you can only use one material for one flow map, so when having multiple scenes with rivers in them, you need one material per river.

When creating the river reference image, a screenshot will be taken based on the size of the plane. In the screenshot, the plane will be shown with a dummy material that is only meant to help you use it as a blueprint when painting flow maps. Although painting flow maps is possible with most advanced apps for image design such as Photoshop, using a simple free tool like "Flow Map Painter" might produce similarly good results with a lot less effort. After creating the flow map, make sure it is saved in the Assets-folder of your project, so you can drag it to the "Flow Map"-attribute of your river material.

IMPORTANT:

Flow maps can produce visible artifacts if they have a very high resolution and compressed color information. It is advised to set the max texture resolution relatively low in the flow map's import settings (256x256 or lower) and to set the format to "Truecolor".

Adding the underwater effects works as it does with the Quick setup, with the only difference being, that the water level detection is now being told that squared planes are used instead of round ones.
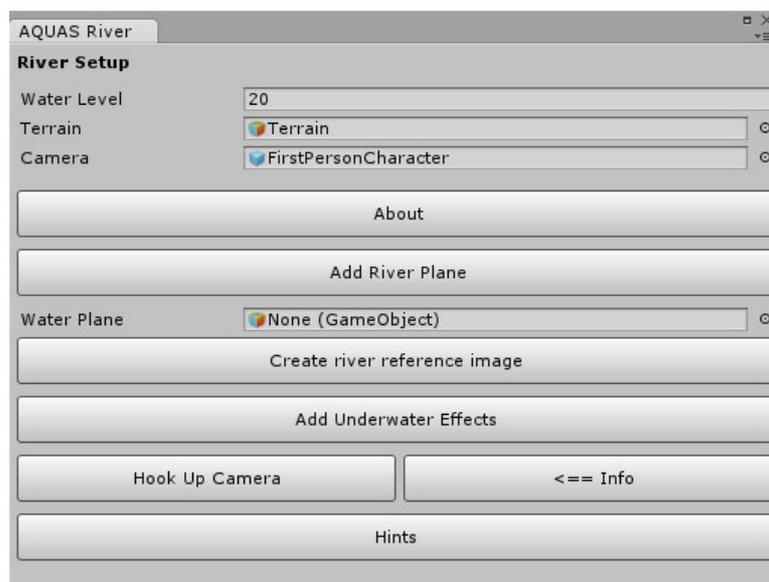
4.   Manual Setup

The quick setup window helps you with the basic setup of AQUAS. However you might want to change some of the configuration, to adjust it to your environment and/or performance level. The tripled textured shader that is being used when setting up AQUAS via quick setup might for instance not fit for a calm water like a swamp or a pond in the desert. Also there are situations in which you have to do the setup manually, for instance if you want to add multiple lakes at different levels.

This chapter will give you a deeper understanding of how AQUAS works.

4.1.   Shaders

The following shaders are avalable:

```
AQUAS
    Bubble
    Camera Effects
        Under Water
        Wet Lens
    Caustics
    Desktop and Web
        Double-Sided
            Double-Textured
            Single-Textured
            Triple-Textured Bumpy
        One-Sided
            Double-Textured
            Single-Textured
    Mobile
        Bicolored
        Bicolored Foamy
        Single-Colored
        Single-Colored Foamy
```

Here's a quick overview over the individual differences between the shaders:

– Mobile shaders don't actually refract light. Looking through the transparent part won't distort what is beneath the surface. This is due to performance reasons on mobile devices.

– The shaders for web and desktop absorb light and thus have a depth-based color as water does in reality. Since this is very performance intensive on mobiles, the mobile shaders work with either one color for the entire water or two colors, one for deep and one for shallow water, depending the target device's performance.

– Mobile shaders are available with and without foam, depending on the target device's performance.

– The triple textured shader uses 3 normal maps for a realistic surface and is best suited for lively waters like oceans. The other shaders are best suited for calm waters like ponds, lakes, swamps and basins, but can also be used in an ocean environment (e.g. in rts games).

– The tiling of the normal textures and the foam textures is not relative to the size of the water plane. Once set, the size of the waves will be constant even if you change the size of the water plane.

– Some parameters have the same effect in all shaders. Higher quality shaders usually have additional parameters for higher customizability.

4.2. Setting up the Water

Setting up AQUAS materials works as it does with any other material. First create a new material. Add the `WaterPlane.prefab` to you scene and position it. Drag & drop the material you just created on the water plane. The material will show up in the water plane's inspector. Select the shader, you want to use. The package contains some ready-made materials, that you can find in the `Materials` folder. You might want to use them as an orientation for customizing your own materials, or simply use them. It is recommended however, that you don't change their parameters, without making backup copies of them.

IMPORTANT: Attach the `AQUAS_Camera` script to your camera, to make sure, depth rendering is enabled on all platforms and quality levels.

a) Parameters

This chapter gives you an overview of all parameters in all shaders. Some of them are not available in certain shaders and some are available in all of them. The following overview should help you customize your water.

Parameter	Function
Normal Texture	Sets the normal map for the shader
Small Waves Texture	Sets the normal map for small waves (only double- and triple-textured shaders)
Medium Waves Texture	Sets the normal map for small waves (only triple-textured shader)
Large Waves Texture	Sets the normal map for small waves (only double- and triple-textured shaders)
Normal Tiling	Sets the tiling of normal maps
Small Waves Tiling	Sets the tiling of normal maps per map for small waves (only double- and triple-textured shaders)
Medium Waves Tiling	Sets the tiling of normal maps per map for small waves (only triple-textured shader)
Large Waves Tiling	Sets the tiling of normal maps per map for small waves (only double- and triple-textured shaders)
Offset (Small/Big+Small)	Blends two normal maps with each other (double textured shader only)
Offset (Small/Big+Small/Big)	Blends two normal maps with each other (double textured shader only)
Main Color	Color that is being absorbed.
Deep Water Color	Darkest water color
Shallow Water Color	Sets the color of shallow water (bicolored mobile only)
Shallow-Deep-Blend	Sets the blending between the colors for deep and shallow water (bicolored mobile only)
Shallow-Deep-Fade	Sets the fading between the colors for deep and shallow water (bicolored mobile only)
Fade	Defines how quickly color is absorbed (Web & Desktop only)
Density	Defines the intensity of the color absorption (Web & Desktop only)
Depth Transparency	Sets the depth based transparency
Shore Fade	Sets the transparency fade between zero level and the deepest point at which the water is still transparent
Shore Transparency	Softens sharp edges at shore

Wave Blend	Blends certain waves out at shore (triple textured shader only)
Wave Fade	Fades certain waves out at shore (triple textured shader only)
Enable Reflections	Enables/Disables reflections
Reflection Intensity	Sets the reflection intensity
Distortion	Sets the reflection distortion
Specular	Sets the specularity
Specular Color	Sets the specular color (except for the triple textures shader – this one uses the light color as specular color)
Gloss	Sets the gloss
Light Wrapping	Sets the light wrapping
Refraction	Sets the refraction (mobile shaders only have a "pseudo-refraction")
Small Wave Refraction	Per-texture refraction (only double- and triple-textured shaders)
Medium Wave Refraction	Per-texture refraction (only triple-textured shaders)
Large Wave Refraction	Per-texture refraction (only double- and triple-textured shaders)
Wave Speed	Sets the wave speed
Small Waves Speed	Per-texture wave speed (only double- and triple-textured shaders)
Medium Waves Speed	Per-texture wave speed (only triple-textured shaders)
Large Waves Speed	Per-texture wave speed (only double- and triple-textured shaders)
Emissive Color	Sets the emissive color (single-colored mobile only) – can be used for things like lava
Emission Intensity	Sets the emission intensity (single-colored mobile only)
Foam Texture	Sets the foam texture
Foam Tiling	Sets the foam tiling
Foam Blend	Sets the foam blend from shore
Foam Visibility	Sets the foam visibility (0 = only water is visible, 1 = only foam is visible)
Foam Color	Sets the foam color
Foam Intensity	Sets the foam intensity
Foam Contrast	Sets the foam contrast
Foam Speed	Sets the foam Speed
Foam Dist. Fade	Sets the distance based tiling to avoid visible tiling at larger distances (only double- and triple-textured shaders)

Foam Dist. Falloff	Sets the falloff for the distance base tiling (only double- and triple-textured shaders)
Underwater Mode	Switches to underwater mode (double-sided shaders only - Manual switching is usually not required, the parameter is accessed via script)
Underwater Transp. Dist.	Sets the distance based transparency for underwater mode (double-sided shaders only)
Underwater Transp. Falloff	Sets the falloff for the distance based transparency (double-sided shaders only)
Enable Custom Fog	Enables independent fog on the water. This option is useful, when working with fog systems, that rely on the z-buffer, like Tenkoku or TOD. (Desktop & Web only)
Fog Color	Sets the color of the fog
Fog Distance	Sets the fog distance from the current position
Fog Fade	Sets the fog fade – higher numbers = sharp transition
Flow Map	Sets the flow map for the river shader (river shader only)
Flow Speed	Sets the flow speed (river shader only)
Using Linear Color Space	Check when using flowmaps in linear color space (river shader only)
Medium Tiling Distance	Sets the medium distance for distance based tiling (triple textured and river shader only)
Long Tiling Distance	Sets the long distance for distance based tiling (double textured, triple textured and river shader only)
Distance Tiling Fade	Sets the tiling fade – higher values = sharp transition (double textured, triple textured and river shader only)

IMPORTANT: *Use the pre-made materials as an orientation, if you're not sure about certain values.*

4.3.   Setting up Caustics

Caustics are a vital part of AQUAS and are being projected to the ground beneath the water surfaces via projector. To add caustics to your water, go to the "Prefabs"-folder and look for the two prefabs named **"PrimaryCausticsProjector"** and **"SecondaryCausticsProjector"**. Drag and drop them **as child objects** on the waterplane in your scene.

The caustics projectors work as a combination of the **AQUAS_Caustics** script and the material attached to the prefab. Here's how to use the parameters in the inspector:

AQUAS_Caustics (Script)

Parameter	Function
FPS	Controls the speed at which the caustic image sequence is being played back
Frames	Array containing the caustic image sequence
Max Caustic Depth	Controls how deep below the water surface, caustics are to be seen.

a)   Material Settings

The material settings of the caustic projectors are accessible, however most of them are being controlled by the **AQUAS_Caustics** script and don't need to be adjusted manually. Here's a brief overview over the material parameters:

Parameter	Function
Tiling (x,y)	Sets the tiling of the caustic texture. *This value doesn't need to be adjusted in the material settings, when using underwater effects - more info in chapter 3.4.*
Offset (x,y)	Sets the offset of the caustic texture – normal case is to have it at (0,0) for the primary and at (0.5,0.5) for the secondary projector
Water Level	Sets the y-position above which caustics are not to be displayed. *This value is controlled by the **AQUAS_Caustics** script and doesn't need to be changed.*
Depth Fade	Sets the y-position beneath the water below which caustics are not to be displayed. *This value is controlled by the **AQUAS_Caustics** script and doesn't need to be changed.*
Intensity	Sets the intensity of the caustic display. *This value doesn't need to be adjusted in the material settings, when using underwater effects - more info in chapter 3.4.*
Distance Visibility	Sets the distance to which caustics can be seen
Distance Fade	Sets the fade of the caustic display

Note: *if you have shore that is below the water level (e.g. in a mountain lake environment), you should change the orthographic size of the caustic projectors to not extend over your waterplane's boundaries, otherwise you'll see caustics outside of the water.*

b)   Caustics & Multiple Water Levels

When using multiple waterplanes at different levels, setting up caustics works almost the same as with a single waterplane. In fact you could just set up a waterplane with caustics and simply duplicate the waterplane together with the caustic projectors to use them elsewhere.

However when using caustics at different water levels, you need to use another material on each primary/secondary projector for each water level. The reason is, that the water level is being controlled by the **AQUAS_Caustics** script, but stored in the material. So when trying to use the same material for caustics at different water levels, the **AQUAS_Caustics** script on the projector objects will try to adjust the water level on the same material to multiple values, which would result in a chattering effect.

Example:

Say you have two lakes with two different water levels. Create your waterplane with the caustic projectors for one of the lakes and don't forget to adjust the orthographic size of the projectors.

Now copy the waterplane with the projectors and position it on your second lake. Now simply go to the materials folder, where the materials for the caustic projectors are stored and duplicate them. Now select the projectors in your second lake and select the duplicated material in the material parameter of your projector component.

Do that for the primary and the secondary caustics projector and the caustics should display correctly at both water levels.

4.4.   Underwater Effects

Manual setup for the underwater effects is a bit more complicated than it is for the waterplane and the caustics. Fortunately you will almost never have to do a fully manual setup. This chapter gives you an in-depth overview over the setup of the underwater effects in AQUAS.

a)   Basic Setup

As mentioned above, you'll almost never have to do a full manual setup for the underwater effects. The effects basically consist of two parts.

One part is a set of two planes that cover your viewport and use specific shaders. Those planes are called lenses **(water lens & air lens)** and in effect they're "faked image effects" for underwater and afloat. They're attached to a prefab called **"UnderWaterCameraEffects"**. Simply drag and drop the prefab as a child object on your camera gameobject and make sure, it's positioned at (0,0,0) in local space.

The second part of the underwater effects are a set of Unity's own image effects with a specific configuration. Adding all those effects and configuring them manually can be very time consuming, which isn't very productive. Fortunately you don't have to do it manually. You can always use the "Hook Up Camera"-button in the "Quick Setup" window, that equips the specified camera with all the neccessary image effects and configures them. That configuration can of course be changed anytime.

Now before the underwater effects can work, we need to specify some missing parameters, that would have otherwise been provided by the quick setup:

1. **Select the UnderWaterCameraEffects gameobject in the hirarchy.**

2. **In the inspector you can see 6 expandable groups of parameters in the "AQUAS_Lens Effects"-component. Expand the group "Gameobjects".**
   – Drag your camera gameobject to the missing "Main Camera" parameter.
   – Open the subgroup "Water Planes"
   – Drag and drop your waterplane from the hirarchy to the missing "Element 0" parameter

Now you have a basic setup for your underwater effects and should be able to test it in play mode.

b)   Parameters

Of course there are lots of adjustments, you can make now, that you have a basic setup for your underwater effects. This chapter will give you an overview over the parameters on all the relevant components/materials as well as some additional information on how the caustic controls, when using underwater effects.

First we will have a look at the parameters on the **AQUAS_Lens Effect** component:

Parameter	Function
Parameter Group: Under Water Parameters	
Fog Density	Sets the fog density underwater
Fog Color	Sets the fog color underwater
Bloom	Sets the bloom intensity underwater
Parameter Group: Game Objects	
Main Camera	Main camera gameobject in the scene – Assign camera gameobject from the hirarchy to it, if empty
Water Lens	Water lens gameobject
Air Lens	Air lens gameobject
Bubble	Bubble prefab
Water Planes	Water planes array – Set Size = amount of waterplanes in the scene and assign the waterplanes from the hirarchy to it
Use Squared Planes	Bool – sets whether to use squared or circular planes – required to determine if underwater – Don't mix squared and circular planes!
Parameter Group: Bubble Spawn Criteria	
Min Bubble Count	Sets minimum bubble count for initial dive
Max Bubble Count	Sets maximum bubble count for initial dive
Max Spawn Distance	Sets maximum bubble spawn distance from camera's position
Average Updrift	Sets the average updrift of the bubbles
Base Scale	Sets the base scale of the bubble
Avg Scale Summand	Sets the basis for the scale randomization of the bubbles: Base Scale + random scale Summand *(≈ Avg Scale Summand)* = Bubble scale
Min Spawn Timer	Sets the minimum spawn timer between bubbles for initial dive
Max Spawn Timer	Sets the maximum spawn timer between bubbles for initial dive

Min Spawn Timer L	Sets the minimum spawn timer between bubbles for long dive
Max Spawn Timer L	Sets the maximum spawn timer between bubbles for long dive
Parameter Group: Wet Lens	
Wet Time	Sets how long the lens stays wet after surfacing
Drying Time	Sets how long the lens takes to dry after wet time is up
Spray Frames	Texture array containing the spray image sequence
Spray Frames Cutout	Texture array containing the spray image sequence basis for alpha cutout via shader
Rundown Speed	Sets how fast droplets run down the lens in FPS when surfacing
Parameter Group: Caustic settings	
Caustic Intensity	[Vector2] - sets the intensity of the caustic effects – [afloat value, underwater value] – (caustic intensity doesn't need to be adjusted in the projector's material, when using this)
Caustic Tiling	[Vector2] - sets the tiling of the caustic texture – [afloat value, underwater value]
Max Caustic Depth	Sets how deep below the water surface caustics are to be seen
Parameter Group: Sound Effects	
Sounds	Audio clip array containing sound files
Underwater Volume	Audio volume for underwater sound effect
Surfacing Volume	Audio volume for the surfacing splash sound effect
Dive Volume	Audio volume for dive splash sound effect
Additional public variables	
Float t	Timer for afloat behaviour – set to zero to trigger wet lens effect
Bool rundown	Set to true to trigger drops running down the lens
Bool underwater	{get; private set;} - Get value to detect if underwater – use this to with custom code for underwater behaviour

Now let's have a look at the Material properties on the "lenses":

WaterLens Parameters

Parameter	Function
Distortion Texture	Sets the distortion texture (default is an alpha ellipse)
Distortion Intensity	Sets the distortion intensity underwater
Distortion Speed	Sets the speed of the rotating distortion

AirLens Parameters

Parameter	Function
Main Color	Sets the main color of the drops from the wet lens image sequence
Transparency	Sets the transparency of the drops from the wet lens image sequence
Specular	Sets the specularity of the drops from the wet lens image sequence
Gloss	Sets the gloss of the drops from the wet lens image sequence
Cutout	Cuts out the parts of the wet lens image sequence, that is not a drop

NOTE: The Air Lens Parameters are set to optimized values and shouldn't be changed if you don't know exactly what you're doing.

c)   Multiple Water Levels

Setting up the underwater effects for multiple water levels is very easy:

1. **Select the UnderWaterCameraEffects gameobject from the hirarchy.**

2. **In inspector expand the parameter group "Game Objects" in the "AQUAS_Lens Effect"-component.**

3. **Expand the "Water Planes"-array.**

4. **Change the size value to the amount of water planes you have.**

5. **Drag and drop all your waterplanes from the hirarchy to the empty elements of the "Water Planes"-array.**

Now the underwater effects should display correctly with multiple waterplanes at different water levels.

5.   Setup via Gaia

To set AQUAS up via Gaia, first create your terrain using Gaia, just as you would normally do. Once you have your terrain ready, go to the Gaia Extensions (GX-button in the Gaia manager). If you have AQUAS imported, it should be visible under "INSTALLED". If it's not, you might have to close and reopen the Gaia manager twice.
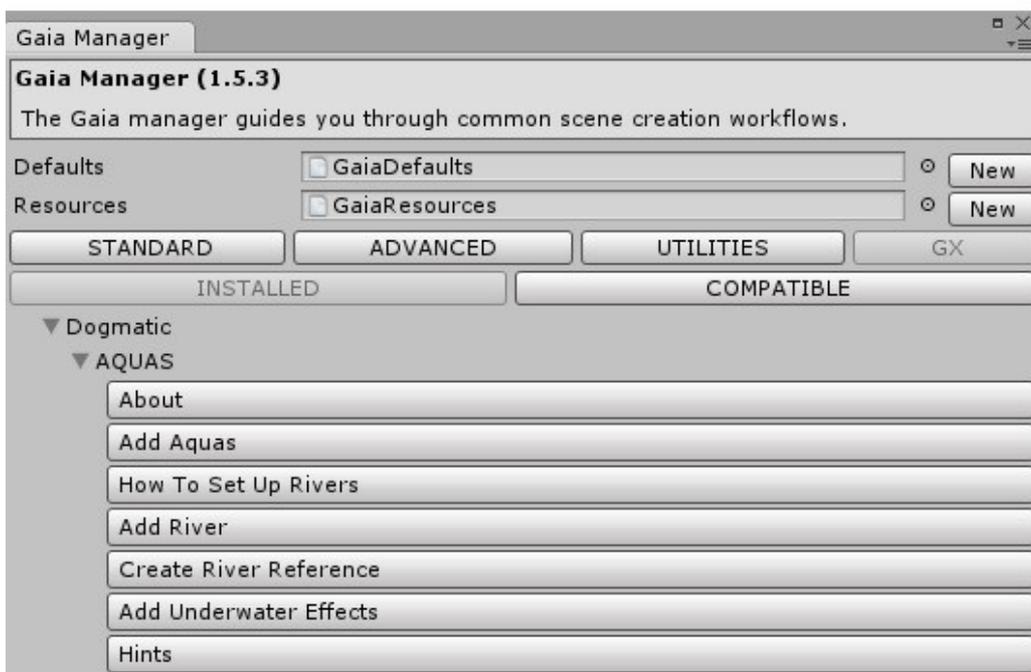
If you can see "Dogmatic" under "INSTALLED", expand it and expand "AQUAS". The about button contains basi information. To add water to the scene, simply click the "Add Aquas"-button. Gaia provides all the neccessary information to AQUAS, so there's nothing else you need to do in terms of scaling and positioning. Same goes if you click the "Add River"-button.

Creating a river reference image works the same way it does with AQUAS's own "River Setup", except you don't have to specify the waterplane to use – it's set automatically. For more information on how to use it to create flowmaps, please read the chapter on AQUAS's "River Setup"-window.

Clicking the "Add Underwater Effects" button will add underwater effects. As with the quick setup, the Gaia setup only gives you a basic setup for AQUAS that you can continue to customize, if you wish.

The "Hints"-button provides some information on how what to keep in mind, when working with custom lighting & fog systems.
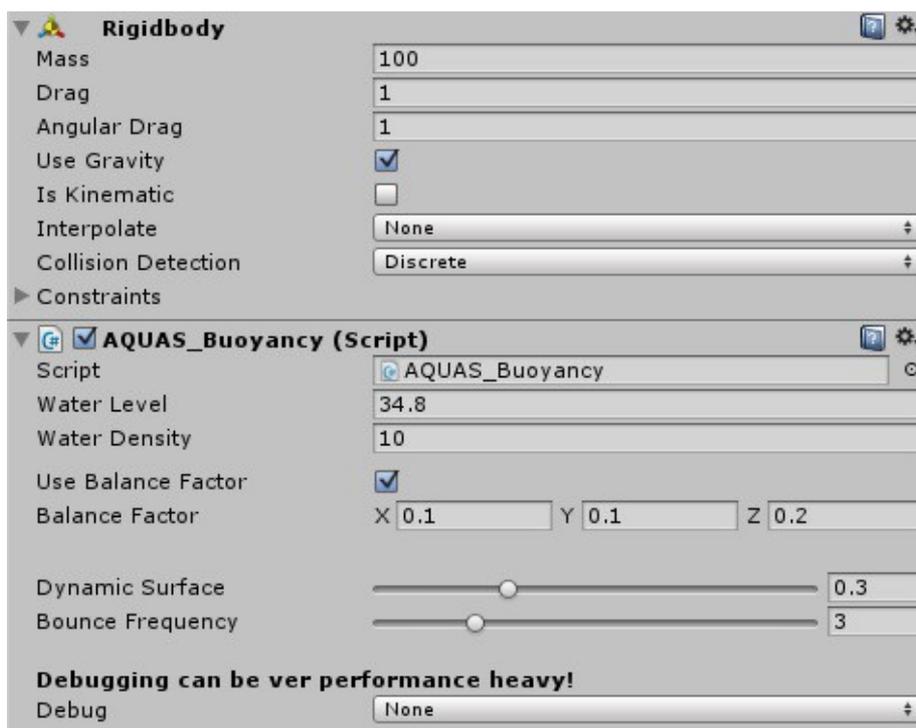
6.   Additional Tools

AQUAS comes with a set of tools that are not neccessarily required but can in some cases prove to be very useful. This chapter will cover how to use them.

6.1.   Buoyancy Effect

AQUAS comes with a basic buoyancy feature. It works on any mesh and has been designed to be used on water with a constant water level. To use it, simply select the object you want the buoyancy applied to in your hirarchy and click

"Add Component" => "AQUAS" => "Buoyancy".

The buoyancy script will also add a Rigidbody-Component to your object. The Object MUST have a Mesh-Filter-Component on it for the buoyancy script to work, because the mesh is the basis for the script to calculate updrift forces.

Rigidbody			
Mass	100		
Drag	1		
Angular Drag	1		
Use Gravity	☑		
Is Kinematic	☐		
Interpolate	None		
Collision Detection	Discrete		
▶ Constraints			
☑ **AQUAS_Buoyancy (Script)**			
Script	AQUAS_Buoyancy		
Water Level	34.8		
Water Density	10		
Use Balance Factor	☑		
Balance Factor	X 0.1	Y 0.1	Z 0.2
Dynamic Surface		0.3	
Bounce Frequency		3	
Debugging can be ver performance heavy!			
Debug	None		

The above image shows what the inspector should look like when you have the buoyancy component attached to an object. First specify the water density. The Water density would in reality be 1000, but since the updrift is always dependent on the object's mass and it's volume too and those things in video games often have no physical significance whatsoever, the density is often set to unrealistic values such as 10.

The Checkbox "Use Balance Factor" is only to be checked, when your object has no collider component on it. AQUAS's buoyancy feature doesn't require a collider component, however without it the torque applied to your object by the updrift forces will be virtually infinite. The balance factor arround all 3 axis will make use of numerical inaccuracy to reduce the torque to an acceptable level. If your object has a collider component attached, you will most likely not need this.

AQUAS's buoyancy feature is meant to be used on water with a constant water level. The sliders "Dynamic Surface" and "Bounce frequency" are to be used to simulate a dynamic surface and have your object bounce up and down slightly. The "Dynamic surface"-slider determines the amplitude of the bounce and the "Bounce Frequency"-slider determines how quickly your object bounces up and down. This simulation works based on altering the water density over time.

Debugging can be useful to see if your mesh is recognized correctly by the buoyancy script. You can debug the faces that are currently used to calculate the updrift forces, you can visualize a representation of the currently applied updrift forces and you can debug a visual representation of the volume used to calculate the updrift forces.

Note:

The buoyancy feature works in conjunction with the Rigidbody component. Having a too high or a too low mass for the currently specified volume and/or water density might result in unrealistic behaviour. Keep the drag forces at a natural level, so the object does neither bounce around like crazy, nor behave as if thrown on a pillow.

6.2. Render Queue Controller

AQUAS's water shaders are all alpha-blended and thus can't use the z-buffer. Shaders that can't use the z-buffer instead use a fixed value for the render order. The higher this value, the higher the priority of the rendering.

Example: Say you have 2 objects with shaders that don't use the z-buffer. If one object has a render queue index of 2000 and the other one has a render queue index of 3000. If those two objects are now in line with the camera view, the object with the render order of

3000 will always be rendered in front of the other object, because it has a higher render queue index. This will also happen, if the object with the lower render queue index is in front of the other object from the camera's view. In some situations this kind of behaviour is undesirable.

In AQUAS's case it can happen that from certain view angles the water is being rendered before tree billboards, if the billboard start distance on the terrain is very low and if the billboards have a lower render queue than the water. Here's what this looks like:

To solve this AQUAS comes with a render queue controller, that enables you to manipulate AQUAS's render queue even on runtime. The script is usually added to the waterplane automatically, but if it isn't, you can add it by selecting the waterplane and then clicking:

"Add Component" => "AQUAS" => "Render Queue Controller".

The component has only one inspector attribute called "Render Queue Index". When set to -1, the water will have it's default render queue, which is 3000. If AQUAS renders ofer certain object, such as billboards, simply set it to something lower, such as 2800 or reduce it as much as neccessary to see what you need to see:

Note:

Altering the render queue of the water can't harm your project, nor can it harm AQUAS, yet still you should use it with caution, because it might result in AQUAS being rendered behind things that should be underwater (e.g. Caustics).

6.3.   Screenshotter

AQUAS comes with a basic Screenshot object, that can be used to quickly make screenshots in the editor. Quickly creating screenshots can be useful to show your work to others, as well as to ease support, when you're experiencing trouble with the package.

The Screenshotter comes as a prefab. Simply drag it from the "Prefabs"-folder and drop it into your hirarchy. Drag and drop your main camera to the "Camera"-attribute of the Screenshotter's inspector, specify the desired outpu resolution of your screenshot and the desired folder, resp. File name to save the screenshots to. The files will get a suffix to the file name containing the date time, so you don't have to specify a new file name for each screenshot. Use the "F12"-key to take a screenshot in play mode.

7.   Trouble Shooting

Problem:

I get this error in the console when trying to add/use underwater effects:

"Assets/AQUAS/Scripts/AQUAS_LensEffects.cs(256,53): error CS0246: The type or namespace name `GlobalFog' could not be found. Are you missing a using directive or an assembly reference?"
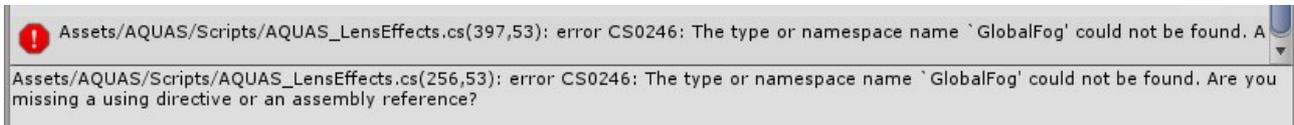
Solution:

Open up the GlobalFog.cs script found at:

`../Assets/Standard Assets/Effects/ImageEffects/Scripts`

At line 9 replace

`class GlobalFog : PostEffectsBase`

by

`public class GlobalFog : PostEffectsBase`

Problem:

I'm getting strange image distortions, even when I'm afloat.

Solution:

Delete the "UnderWaterCameraEffects" object from the scene and add it again. You can either add it manually (as described in 3.4.a) or via the Quick Setup window.

Problem:

My scene looks very bright when I add the underwater effects to the scene (washed out).

Solution:

That's a Unity bug that – as far as known – occurs on OS X whenever one is using multi-sample anti-aliasing (MSAA) and image effects in linear color space. The solution is either to upgrade Unity to a version that has this problem fixed or avoid working in linear color space when using AQUAS's underwater effects.

Please have a look at the following entries in the Unity bug tracker for more information:

"(Imageeffects) Image effect brightens scene in linear color space"

"(Grabpass) Material with grabpass shader renders much brighter on OpenGL in linear"

Problem:

I've added AQUAS to the scene, but the water is invisible.

Two possible solutions:

1. If you're working on DirectX9, please switch to DirectX11 or OpenGL. AQUAS uses surface effects, that are not supported on DirectX9.

2. Attach the AQUAS_Camera.cs script to your main camera. On some platforms (Android, Webplayer, WebGL) the water won't show in forward rendering mode, because it requires depth rendering to be enabled, which by default is only enabled in deferred rendering mode. The script enables depth rendering in forward rendering mode.

Problem:

I've made a build for mobile, but the water has a jagged shoreline where it intersects with the terrain.

Solution:

This behaviour occurs on certain mobile devices (e.g.: Nexus 5 & 6), while most devices show the water correctly. Unfortunately there's no actual solution to this yet, because it's uncertain, what's causing the problem. However there's a workaround that will minimize the problem:

Reduce the Depth transparency in the inspector of the waterplane's material to 0. The water won't be transparent anymore, but the Shore Transparency parameter will still keep shore edges smooth – not an ideal solution but the only one for the time being.

Problem:

I'm using AQUAS on mobile, but it's very slow.

Solution:

Make sure, you're using one of the mobile shaders. The shaders for web & desktop are much more demanding, and will most likely bring mobile devices to their needs.

Problem:

I'm using the AQUAS mobile shader on mobile, but it's still very slow.

Solution:

AQUAS's mobile shaders are designed for today's mid- to high-end devices. Using it on older devices or simply on low-end devices might result in bad performance. You can evaluate the performance on different devices by downloading this **DEMO APK >>**

8.   Additional Information

- The current version of AQUAS is v1.3
- The scripts used in this package are as complete as they can be without limiting you in the way you design your game, they are not enclosed though. You're free to edit all included scripts to make them fit your exact needs
- Features to be added with future updates in the following order:
  - Splashing particle effects
  - Non-linear water waves

Note: AQUAS doesn't work with DirectX9. As fas as tests went, AQUAS supports all platforms, except for Windows phone.

For video tutorials on the use of AQUAS, please visit the following link:

https://dogmaticgames.wordpress.com/products/aquas-water-shader-set/tutorials/