Water 2D Kit
Version 1.4

INTRODUCTION

The package contains two water refraction techniques:

1. GrabPass (GP) – the shader grabs and transforms what is directly under the water geometry. It is very easy to use and works fast on most platforms (Raving Bots\Examples\ Water 2D GrabPass).

2. RenderTexture (RT) – the shader uses a texture rendered by a camera placed behind the water geometry. It can be optimised to give the best performance on mobile platforms (Raving Bots\Examples\Water 2D RenderTexture).

COMPONENTS

The description below provides details about parameters of the components used in the example scenes (Raving Bots\Examples\).

Water2DEffects

Water2DEffects detects collisions with water and instantiates a splash FX.
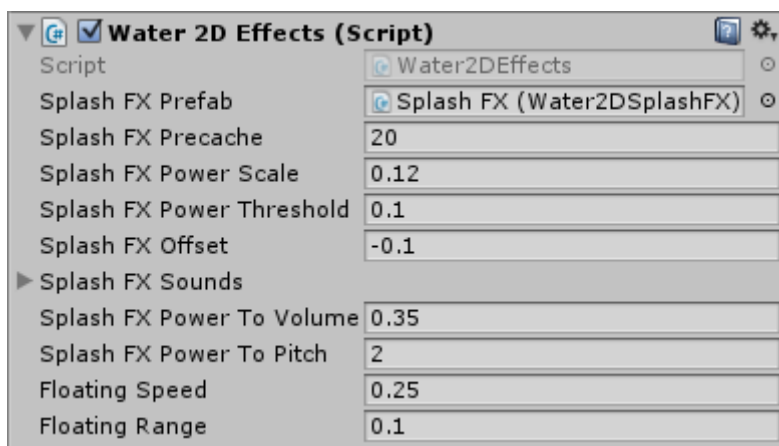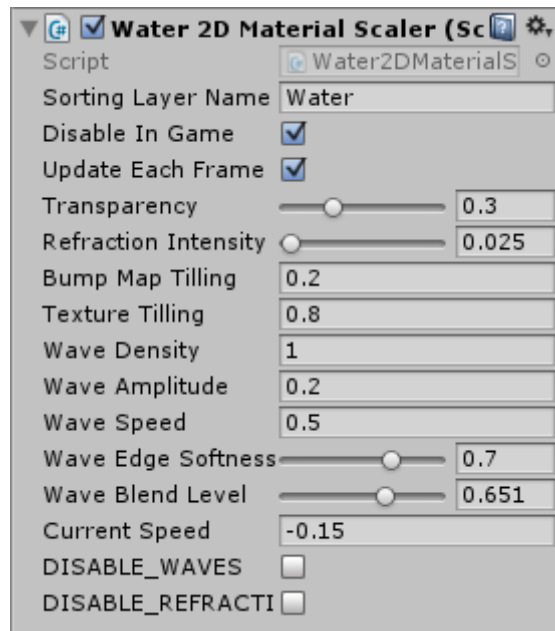

Parameters:

1. **Splash FX Prefab** – a reference to the Water2DSplashFX prefab.
2. **Splash FX Precache** – the number of Water2DSplashFX instances prepared before they are needed.
3. **Splash FX Power Scale** – the component calculates a power of the collision of an object with water, and this parameter is used for scaling the power.
4. **Splash FX Power Threshold** – if the power is smaller than this threshold, then the collision is ignored.
5. **Splash FX Offset** – defines a distance from the collision to the splash FX position.
6. **Splash FX Sounds** – a set of water splashing sounds.
7. **Splash FX Power To Volume** – the collision power is multiplied by this parameter to calculate sound volume.
8. **Splash FX Power To Pitch** – the collision power is divided by this parameter to calculate sound pitch.
9. **Floating Speed** – speed of animating the Surface Level of BuoyancyEffector2D.

10. **Floating Range** – the range of the Surface Level animation.

Water2DMaterialScaler

Water2DMaterialScaler automatically adjusts the parameters of a water material depending on its gameObject scale. It is also used for customizing material appearance. It should be disabled during the game to save performance.
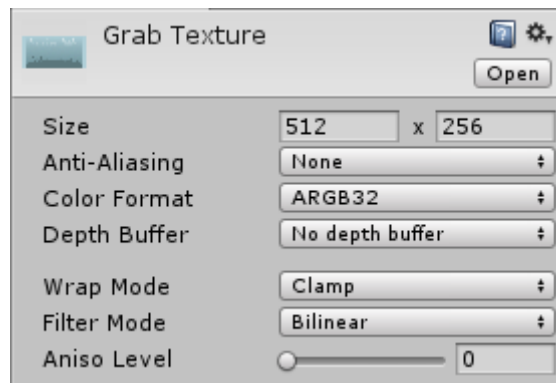

Parameters:

1. **Sorting Layer Name** – determines the order of water rendering.
2. **Disable In Game** – disables the component in game on Awake() if checked.
3. **Update Each Frame** – overrides the material settings in each frame if checked.
4. **Transparency** – transparency of the overlay texture.
5. **Refraction Intensity** – a strength of the glass effect.
6. **Bump Map Tilling** – tilling of the normal map.
7. **Texture Tilling** – tilling of the overlay texture.
8. **Wave Density** – affects the width of a wave.
9. **Wave Amplitude** – affects the height of a wave.
10. **Wave Speed** – affects the speed of wave animation.
11. **Wave Edge Softness** – adjust to have more flat or pointy waves.
12. **Wave Blend Level** – defines a height in which waves start to affect the material.
13. **Current Speed** – velocity of a horizontal water flow.
14. **DISABLE_WAVES** – shader keyword used to disable wave animation.
15. **DISABLE_REFRACTION** – shader keyword used to disable the refraction effect.

RENDER TEXTURE

There are several optimisations that can be applied to improve the performance for slower machines (Raving Bots\Examples\Water 2D RenderTexture). First, adjust the resolution of the render texture that stores grabbed underwater objects (Raving Bots\Textures\Render\Grab Texture):

Grab Texture

Open

Size	512	x	256

Anti-Aliasing   None
Color Format   ARGB32
Depth Buffer   No depth buffer

Wrap Mode   Clamp
Filter Mode   Bilinear
Aniso Level   0

Make sure that the texture size is POT (power-of-two) and matches the aspect ratio of the game camera. The texture is rendered by a camera in the scene (Main Camera\Grab Camera game object):

Grab Camera   □ Static

Tag Untagged   Layer Default

Transform

Position	X 0	Y 0	Z 12
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Camera

Clear Flags   Skybox
Background
Culling Mask   Everything

Projection   Orthographic
Size   2.8
Clipping Planes   Near 0.3   Far 1000

Viewport Rect
X 0   Y 0
W 1   H 1

Depth   -2
Rendering Path   Use Player Settings
Target Texture   Grab Texture
Occlusion Culling   ✔
HDR   □

Target Display   Display 1

Water 2D Update Render Tex

Script   Water2DUpdateR
Max Grabs Per Seco   20

The camera is referenced by **Water2DGrabRenderTex** component in game objects holding the water material (e.g. Water 2D Material 0 game object). The component recalculates UV coordinates of the grabbed texture based on the camera position.

The frequency of redrawing the render texture can be changed in **Water2DUpdateRenderTex** component, which is attached to the Grab Camera. Set **Max Grabs Per Second** = -1 to update every frame. The texture can be rendered once if the camera and underwater objects are static.

RAVING BOTS

Advanced users can customise **Culling Mask** in the Grab Camera to filter rendered objects.

UPGRADE NOTES

If you were using the previous version of the package:

1. For all materials using the shaders, replace **Water/Water 2D *** with
   Water/GrabPass/Water 2D *.
2. Delete old files.

KNOWN ISSUES

Please don't move **Water2D.cginc** outside the folder that contains the shaders. If you didn't move the file and the editor says it is missing, please restart Unity or Reimport assets.