Thank you

Thank you very much for choosing *Crest Ocean System* 4.5 for HDRP!

When upgrading *Crest*, make a backup of your project and remove the existing Crest files before installing the new package.

Please follow *@crest_ocean* on Twitter for news and updates, and drop in to the Crest Discord server `https://discord.gg/g7GpjDC` to say hello!

Crest began life as open source software hosted here: `https://github.com/crest-ocean/crest`. This may be a useful resource for issue searching/posting, for looking at experimental development branches, looking at commit history for files, and misc.

Note: Unity 2019.4 and HDRP 7.3.1 or later are required. The most recent version of each is recommended due to the large volume of fixes and improvements that Unity are making.

Documentation

There is a getting started video available on YouTube here: `https://youtu.be/FE6l39Lt3js`. There are additional tutorial videos on this channel covering other aspects of *Crest*.

Refer to *userguide.pdf* alongside this document for full documentation, including detailed setup steps.

Support

There are a number of channels to get support. First and foremost, you can contact us directly via email: support@waveharmonic.com.

Another support channel is the *Crest* Discord: `https://discord.gg/g7GpjDC`.

Finally issues can be searched and posted on the *Crest* GitHub: `https://github.com/crest-ocean/crest`.

Notes

- Some of the example scenes require a new layer to be added to your project called Terrain. *Crest* is unable to add this layer to your project automatically, so it will throw an error if this layer is not found.

Release Notes

4.5

- Add soft/volume shadows support

- Add light/shadow layer support
- Remove caustics strength scaling by sun light and sea depth
- Remove ocean depth cache updating every frame in edit mode
- Add option to ocean input to allow it to move with ocean surface horizontally (was always on in last version)
- Allow save depth cache to file in edit mode
- Validate OceanRenderer transform component
- Validate enter play mode settings
- Improve feedback in builds when spectrum is invalid
- Improve spectrum inspector
- Fix underwater effect for MSAA
- Fix many cases where gaps would appear with underwater effect
- Fix underwater effect rendering at top of viewport in certain cases
- Fix shader errors for HDRP 8.2
- Fix undo/redo for spectrum inspector
- Fix dynamic waves crashing when flow or depth sim not enabled
- Fix culling issues with turbulent waves
- Fix precision issues causing gaps in ocean surface
- Fix shadow sampling not following camera after changing viewpoint
- Fix shadow sampling not following scene camera
- Fix caustics and shadows not being correctly aligned
- Fix material being allocated every frame in edit mode

4.4

- XR: add single pass instanced support to underwater effects
- Gerstner waves from geometry shader - allow wave scaling using vertex colour
- Performance: Fix for ocean depth cache populating every frame erroneously
- Usability: disable inactive fields on ocean components in Inspector
- Validation: improve lighting settings validation
- Fix for buffer overrun in height query system which caused crashes on Metal

- Fix for height query system breaking down at high frame rates when queries made from FixedUpdate
- Fix height queries when Scene Reload is disabled
- Fix various null reference exceptions in edit mode
- Fix for small wavelengths that could never be disabled
- Fix popping caused by shallow subsurface scattering colour
- Fix some null exceptions if OceanRenderer is not enabled in scene
- Fix mode (Global/Geometry) not applying in edit mode for ShapeGerstnerBatched component
- Fix global keywords not being local in underwater shader
- Fix ocean material keywords not applying to underwater
- Fix underwater breaking when dynamic scaling is used
- Fix caustics occasionally appearing on underside of surface
- Fix caustics briefly being too intense when switching cameras with adaptive exposure
- Fix indirect lighting controller multipliers not being applied
- Fix primary light intensity not reducing when primary light goes below the horizon
- Fix null exceptions when primary light is unset
- Clean up validation logging to console when a component is added in edit mode

4.3

- Add Submarine example scene created by the Digital Wizards team (Aldana Zanetta and Fernando Zanetta).
- Ocean now runs in edit mode
- Realtime validation in the form of inspector help boxes
- Fix *Segment registrar scratch exhausted* error that could appear in editor
- Fix underwater effect rendering when using baked occlusion culling
- Fix gaps appearing in underwater effect for very turbulent water
- Fix underwater raising exception when switching cameras
- Fix caustics rendering short of ocean surface when underwater

4.2

- Clamp reflection ray to horizon to avoid picking up below-horizon colours.
- Use sampler settings for normal map textures to allow changing filtering settings. Turned on anisotropic sampling to reduce blurring.
- Fix for a few cases where a crack or line is visible at the horizon.
- Fix for caustics showing above surface.
- Fix foam normals which were not working.
- Scale caustics intensity by lighting, depth fog density and depth.
- Show proxy plane in edit mode to visualise sea level.
- Fix leaked height query GUIDs which could generate 'too many GUIDs' error after some time.
- Validate ocean input shader, warn if wrong input type used.
- Fix for cracks that could appear between ocean tiles.
- Fix for null ref exception in SRP version verification.
- Warn if SampleHeightHelper reused multiple times in a frame.
- Metal - fix shader error messages in some circumstances.
- Fix for erroneous water motion if Flow option enabled on material but no Flow simulation present.
- Fix sea floor depth being in incorrect state when disabled.

4.1

- Automatically pick the *sun* light if no *Primary Light* is specified.
- Fix flow not affecting displaced waves.
- Fix flow not working in *Whirlpool* example scene in standalone builds.
- Fixed caustics effect when underwater and added distortion.
- Add support for local patch of Gerstner waves, demonstrated by GameObject *GerstnerPatch* in *boat.unity*
- Darkening of the environment lighting underwater due to out-scattering is now done with scripting. See the *UnderwaterEnvironmentalLighting* component on the camera in *main.unity*.
- Remove object-water interaction weight parameter on script. Use strength on material instead.
- Fix garbage allocations.
- Fix PS4 compile errors.

- Better retention of foam on water surface under camera motion.
- Multiple fixes to height query code that could produce 'flat water' issues or use incorrect wave data.

4.0

- First release!