

## Thank you

Thank you very much for choosing *Crest Ocean System* 4.3 for URP!

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 2019.3.x and URP 7.1.2 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://www.youtube.com/watch?v=TpJf13d\\_-3E](https://www.youtube.com/watch?v=TpJf13d_-3E), and other tutorial videos on this channel.

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](mailto: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

- *Crest LWRP* is now deprecated as LWRP is not maintained or supported by Unity. Please upgrade to URP.
- 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.
- Custom sky assets may require their code to be added to the ocean shader for the fogging/scattering to work. The ocean shader *Ocean.shader* has a comment pointing out where such code may need to be inserted: "If you are using a third party sky package such as Azure, replace this with their

stuff!”. Please see the wiki on *Crest* GitHub for more information and examples.

## Release Notes

### 4.3

- **Crest LWRP deprecated.** We are no longer able to support LWRP, and have removed the LWRP version of Crest in this release. Do not install this version if you need to remain on LWRP.
- 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
- Make compatible with dynamic batching
- Add option to disable occlusion culling in planar reflections to fix flickering (disabled by default)

### 4.2

- 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.
- Fix caustics stereo rendering for single-pass VR

## 4.1

- Bump version to 4.1 to match versioning with *Crest HDRP*.
- Clip surface shader - add convex hull support
- Add support for local patch of Gerstner waves, demonstrated by GameObject *GerstnerPatch* in *boat.unify*
- Darkening of the environment lighting underwater due to out-scattering is now done with scripting. See the *UnderwaterEnvironmentalLighting* component on the camera in *main.unify*.
- 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.
- Fix NaN issues in height query code that could produce 'flat water' issues.

## 3.8

- Fix for missing shadergraph subgraph used in test/development shaders. This does not affect main functionality but fixes import errors.
- Refactor: Move example content into prefabs to allow sharing between multiple variants of Crest

## 3.7

- Clip surface shader - replaces the ocean depth mask which is now deprecated
- Removed the deprecated GPU readback system for getting wave heights on CPU
- Exposed maximum height query count in *Animated Wave Settings*
- Support disabling *Domain Reload* in 2019.3 for fast iteration

## 3.6

- Third party notices added to meet license requirements. See *thirdpartynotices.md* in the package root.
- VR refraction fix - ocean transparency now works in VR using *Single Pass* mode. This fix was actually in version 3.5 but we missed the release note item, so including here.

### 3.5

- Gizmos - color coded wireframe rendering of geometry for ocean inputs
- Object-water interaction: 'adaptor' component so that interaction can be used without a 'boat'. See *AnimatedObject* object in *boat.unity*.
- Object-water interaction: new script to generate dynamic waves from spheres, which can be composed together. See *Spinner* object in *boat.unity*.
- Fix visual pop bug at background/horizon when viewer gains altitude
- Input shader for flowmap textures
- Better validation of depth caches to catch issues
- Fix for compile errors for some ocean input shaders
- Documentation - link to new tutorial video about creating ocean inputs

### 3.4

- Ocean depth cache supports saving cache to texture on disk
- Ray trace helper for ray queries against water
- Fix for dynamic wave sim compute shader not compiling on iOS
- Input shader for flowmaps
- Shader code misc refactors and cleanup

### 3.3

- Fix for compute-based height queries which would return wrong results under some circumstances (visible when using Visualise Collision Area script)
- VR: Fix case where sea floor depth cache was not populated
- VR: Fix case where ocean planar reflections broken

### 3.2

- Add links to recently published videos to documentation
- Fixes for wave shape and underwater curtain on Vulkan
- Fix for user input to animated wave shape, add to shape now works correctly
- Fix for underwater appearing off-colour in standalone builds
- Fix garbage generated by planar reflections script
- Fix for invalid sampling data error for height queries
- Fix for underwater effect not working in secondary cameras
- Asmdef files added to make Crest compilation self-contained

### **3.1**

- Made more robust against VR screen depth bug, resolves odd shapes appearing on surface
- Preview 1 of Crest URP - package uploaded for Unity 2019.3