



## QUICK START

Add WaterVolume and BoxCollider components to a GameObject. Any rigidbody with a box, sphere, mesh or capsule collider will float inside that box collider.

## PURPOSE

Water Volume is the simplest way to objects float in any space you define as water. It's multi-threaded and memory efficient. Objects in the water need no special configuration, just a collider and a rigidbody. You have control over buoyancy, viscosity, flow and more. You can define a Water Volume area with a simple box collider or use multiple animated meshes (CPU deformations) to create dynamic surfaces.

Water Volume does not include or require specific water shaders. Any water effect on a flat surface or water effect with CPU mesh deformations will work together to not just look like water, but act like it.

## QUICK START

You don't even have to worry about creating a cube with a box collider.

Just drag: "Plugins/WaterVolume/Water Volume" in to your scene and stretch it however you need.

You're ready to float any object with a rigidbody and a box/capsule/sphere or collider.

## DEMO

If you want a fancier example, open up the "Demo" scene. There you'll find examples of:

- Blend shape driven water surface animation.
- Hooking in to events to create a splashing particle effect.
- Read force data out of objects to create a "GizmoVisualizer"
- A distance based observer to improve performance in large areas.
- Turning on lift simulation for specific objects using an ItemOptions component.

## FEATURES

- Adjustable buoyancy
- Adjustable viscosity (drag)
- Viscosity occlusion (draft)
- Simulated lift forces (like wings)
- Multi-threaded, optionally automatically scaled to match CPU core count
- Enter and exit volume events
- Can use multiple meshes or multiple skinned meshes for animated surfaces. (CPU vertex displacement only, not GPU)
- Meshes can be added and removed from the simulation at runtime
- Buoyancy and drag affect only the underwater parts of objects
- Surface area and rotation aware viscosity
- Optional directional "flow" force
- Can activate/deactivate floating items based on the distance from an observer
- Exposes per floating item information like distance to surface and underwater center
- Items can be tracked in the water but not affected. For tracking how deep items are without floating them.

## API

### Broadcast messages

OnEnterWater(int guid)

Sent to GameObjects when they touch water

OnExitWater

Sent to GameObjects when they fully exit water

### Events

OnItemEnteredWater

OnItemExitedWater

OnItemCenterEnteredWater

OnItemCenterExitedWater

All events use this delegate:

```
public delegate void ItemDelegate(ItemInWater item);
```

Example:

```
water.OnItemEnteredWater += MyOnItemEnteredWaterFunction;  
function MyOnItemEnteredWaterFunction(WaterVolume.ItemInWater item){  
    // My code here. See SplashExample.cs for more.  
}
```

### **WaterVolume.WaterVolume instance**

Public properties are documented with mouse over text in the inspector.

```
public void AddMesh(GameObject obj)
```

Used at runtime to tell WaterVolume to find a mesh or skinned mesh component on obj to be used as a water surface. If the obj is later destroyed, WaterVolume will recognize that and silently stop trying to track it.

```
public ItemInWater GetItem(int guid)
```

Returns a WaterVolume.ItemInWater instance if an object with a matching guid is inside the WaterVolume. Guids can be found using gameObject.GetInstanceID(). Returns null if no matching object exists

```
public void OnlyTrack(GameObject go)
```

Tells WaterVolume not to alter the velocity of the specified GameObject. It will still receive broadcasts and respond to GetItem calls.

### **WaterVolume.ItemInWater**

Reading properties of ItemInWater instances can be useful when responding to events like water entrance and exits. Many of ItemInWater's public methods and properties are only useful internally by WaterVolume.WaterVolume.

Some notes on the most useful:

float distanceToSurface

Vertical distance from the center of the item to the nearest surface vertex above the water

Vector3 underWaterCenter

The estimated center of the underwater portion of the item

WaterVolume water

Useful if you are using multiple water volumes and want to know which holds this item

Vector3 waterEventPoint

The world space position of the most recent water event such as water touched, exited, center entered water, center exited.

## SUPPORT

Please email [support@popcannibal.com](mailto:support@popcannibal.com) with any questions, problems, suggestions and requests.