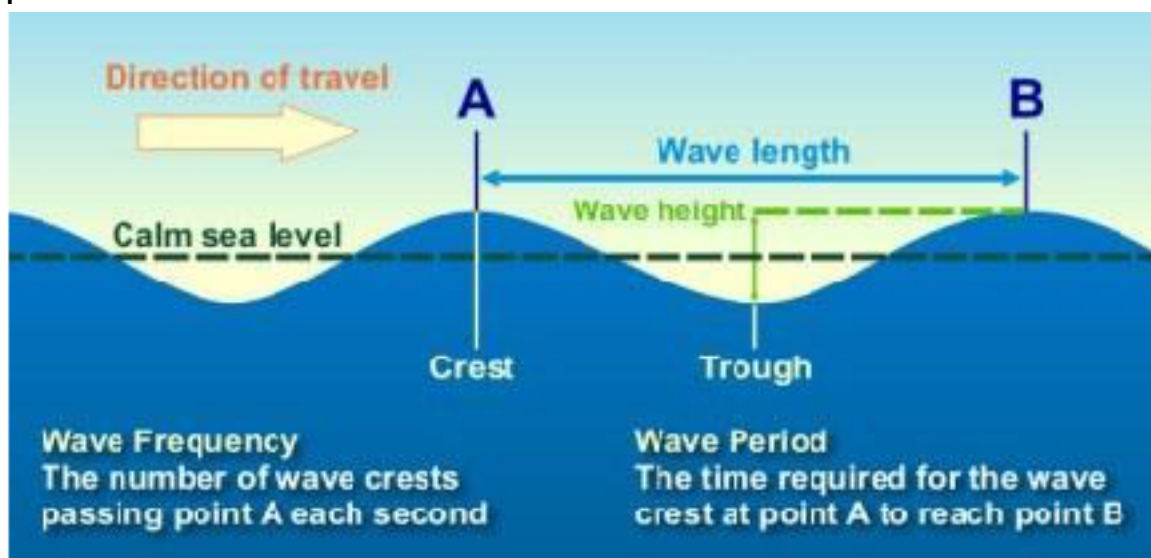
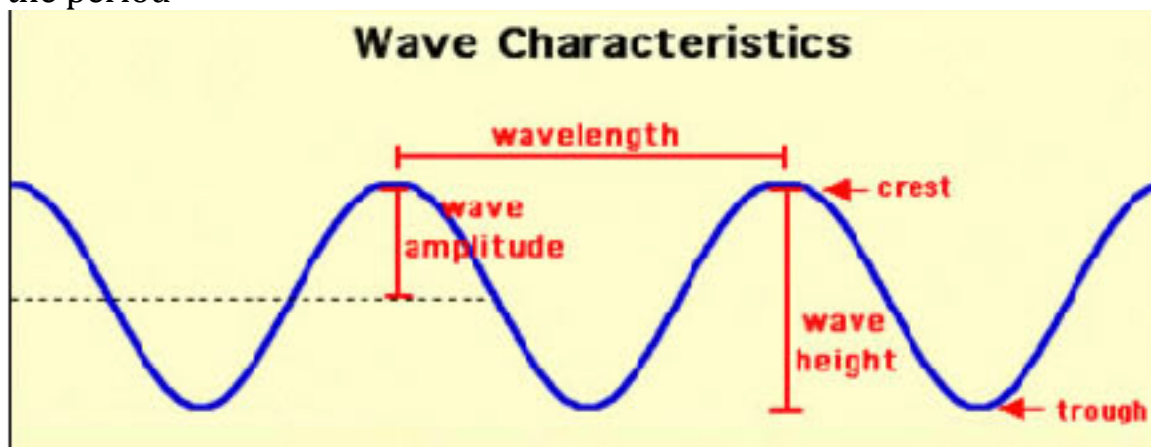


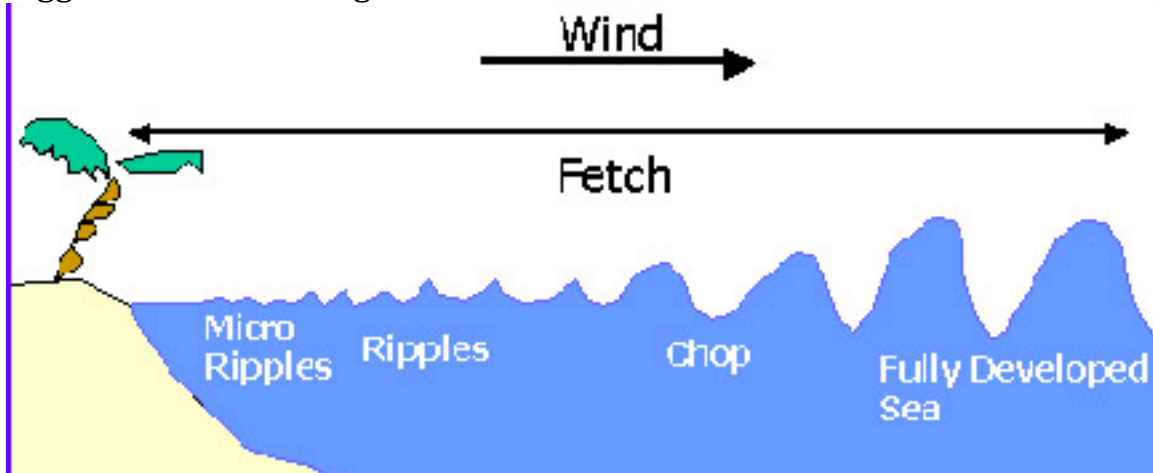
Sea Conditions and water Features

There's a song written by James Taylor and the lyrics go something like this, "winds out on the ocean, blowing as they choose, those winds don't got no emotions and they don't know the blues". But those winds out there on the ocean can sure create the blues unless you understand the effects that will occur because of them. Let's look at some definitions and some wind effects and then we will analyze the water features you will find in currents, tidal waters and around headlands.

Waves are mostly created by large storms out at sea and when they come closer to the shoreline these features have an altering effect on them. Wave length is measured from crest to crest can also be called the period



The more wind travels over open seas unobstructed the more wind can pick up speed and the larger the waves. This is called Fetch, and we see bigger waves with longer Fetch.



Wind Wave:

All wind generated waves start as a wind wave. If they are able to travel far enough and the wind also blows fast enough they will form swell. Long fetch that is unobstructed wind will form swell. So swell will be longer waves easier to handle in your kayak due to their length and regularity, particularly when you are in deep water. When the bottom pushes up or the swell goes over a large rock it will become steeper and more difficult to handle.

Wind waves are generally shorter and steeper than swell. This means their period will be shorter. This makes them steeper and more dangerous for that unsuspecting kayaker. One lovely thing is wind waves don't have a great deal of energy so they calm down quickly when the wind decreases. Swell on the other hand can continue much longer and you may have wind waves coming from one direction and swell coming from another when paddling on open coastlines.

Clapotis Wave:

When waves travelling from two different directions meet they can create a high steep waves and deep valleys particularly when they meet over shallow waters, reefs or rocks. Waves refracting or rebounding off a headland can also cause Clapotis waves.



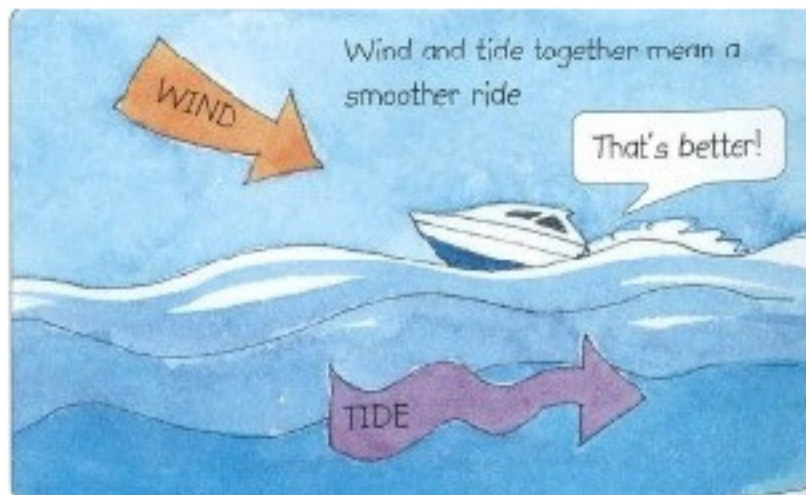
Clapotis Waves can be dangerous to kayak groups if not aware of the surroundings.

Storm Surge and Large Onshore and Offshore Winds.:

Barometric pressure puts weight on the oceans surface with **High** pressure depressing the water surface due to its weight; conversely **Low** pressure allows the water to rise. Changes in barometric pressure of 30 millibars can change the height of water by as much as one foot or .3 metres. This has much graver effects when camped at the end of long inlets during a severe drop in pressure, which can easily flood your camp site. If prolonged winds with a long fetch are coming into an inlet this further increases the tidal height that will be seen. Therefore strong wind blowing on-shore will raise sea level tides. If your group is camped at the end of a long shallow inlets and low pressure is advancing rapidly, you will have strong inflow winds coupled with low barometric pressure and this can make abnormally high tides –beware of flooding in your campsite and or boats getting flooded and taken out to sea. The opposite is also true if you have off shore winds coupled with a high pressure you will see lower tide levels than expected.

Wind against Tide:

This is a local hazard almost everywhere. When you have wind against tide it creates a much steeper choppy wave. The wave height increases and the period decreases. The alternate is also true when tide and wind are going in the same direction wave height decreases and period increases, creating a smooth ride.



Seiche Waves:

When paddling in narrow inlets and wind pushes water against a steep lee shore the water sloshes back across the inlet creating steep confused waters, similar to when you step into your bathtub. These Seiche waves ("saysh") are typically seen in large lakes and rebound waves back to the opposite shoreline similar to what happens in a storm surge.

Rebounding Waves:

Created along steep shorelines, docks and piers these waves strike the object and rebound backwards. The rebounding wave heads back out to sea creating a confused wave that gets steeper as it hits incoming waves. In confined inlets and headlands this rebounding wave can be more dangerous than larger bays where it will dissipate quicker.

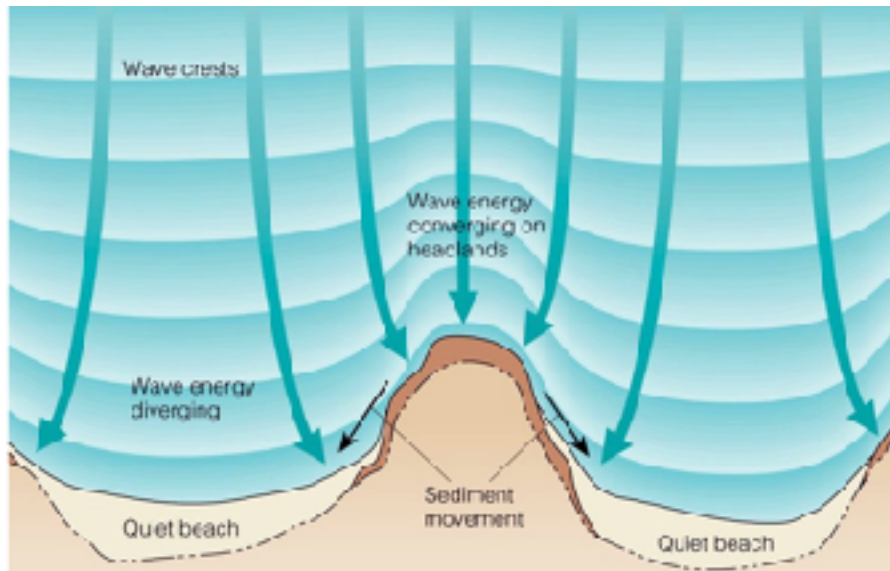


Rebounding off a headland and coming back to hit the incoming wave.

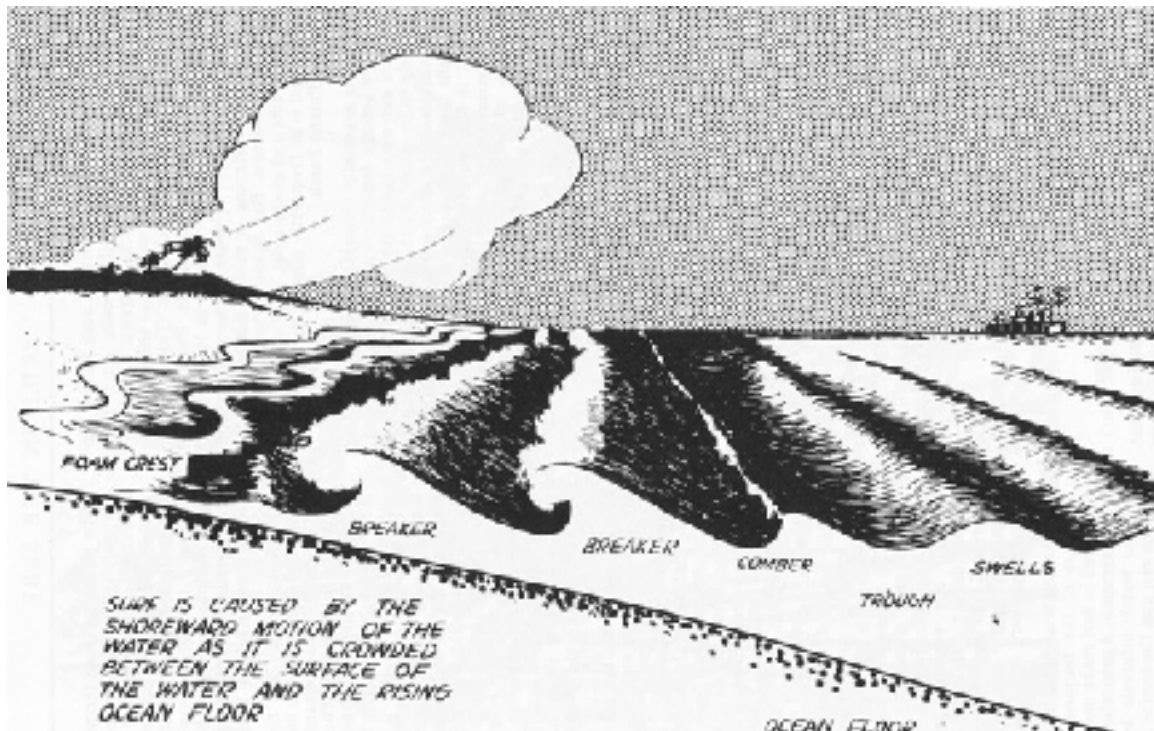
Refracting Waves:

The bending or refracting of a wave can create unexpected hazards to a kayak group. A refracting wave may actually bend right around an object like a boulder and create very confused seas similar to what is seen in a rebounding wave.

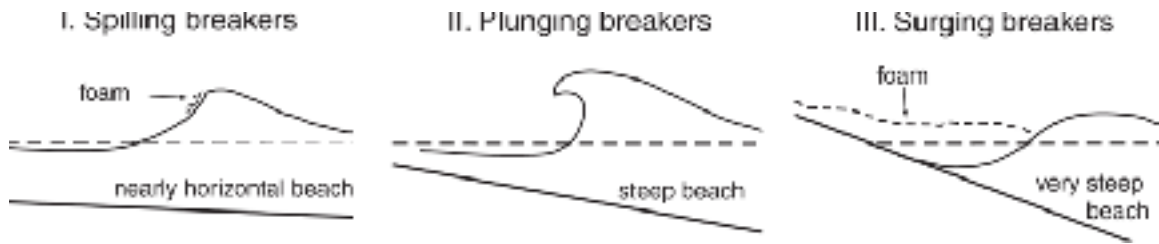
Waves can bend due to headlands and other features. A good rule to remember is that headlands concentrate the wave energy while bays tend to dissipate this energy. See in this diagram how the wave period near the headland is shorter and waves will be heightened.



Surf Formation



Surf is formed by the geography of the land below the water. Long gradual sandy beaches are the safest offering gradual spilling waves. Kayak guides need to know how to safely land their groups in all conditions and know what terrain creates dangerous plunging surf and what conditions form a gradual spilling wave



Spilling Waves: They release energy gradually making it easier to paddle through. It is associated with flat, gradual beaches and can be ridden by a kayaker easier than the other two wave types. Several techniques are used to take this wave into the beach. One method is paddling quickly on its backside and using good timing to avoid the breaking wave all together. Another method is to paddle into the clear water from the wave's peak on an angle and performing a stern rudder and opposite edging to run to the clear face, then high brace or low brace against the white wash once it breaks for support. This moves the kayak sideways toward the beach until the wave energy diminishes. This will be practiced in the AOG upgrade and Full AOG.

Plunging Waves: Also called dumping waves release their energy in an explosive burst near the shoreline. These are difficult to paddle through from beach to ocean and can create a slam onto rocks or beach going from ocean to beach. They are associated with a steep bottom.

Surging Waves: There is no time to brace in the water, the wave breaks and surges on the beach or rocks in an explosive force. Associated with very steep bottoms. Any steeper and the wave would rebound back to seaward. Not a good place to land your kayak group or yourself.

Effects of Current:

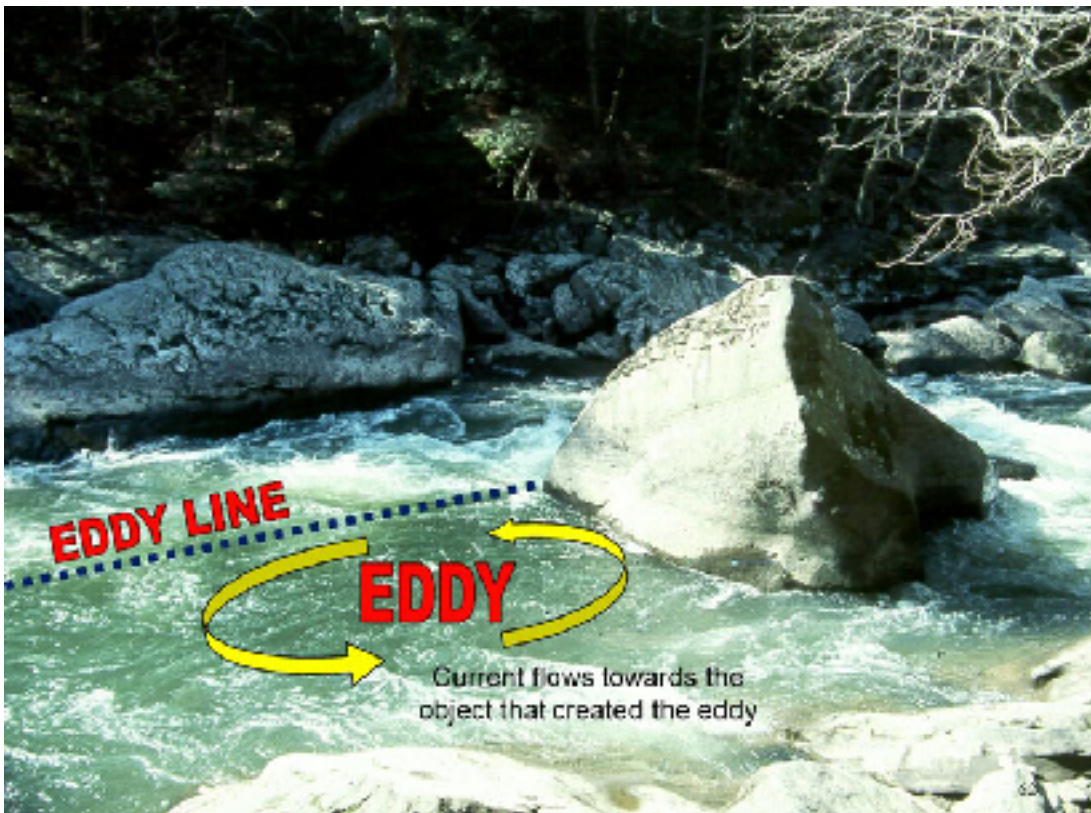
As current travels over various features on the ocean floor they generate waves, eddies, overfalls, standing waves, tidal streams, tide races and whirlpools. We will review and differential these.

Eddy: A quasi circular motion of the water in a relatively small area which is formed in the Lee (back side) of an obstruction or along the

edge of two regions with different current speeds and directions.

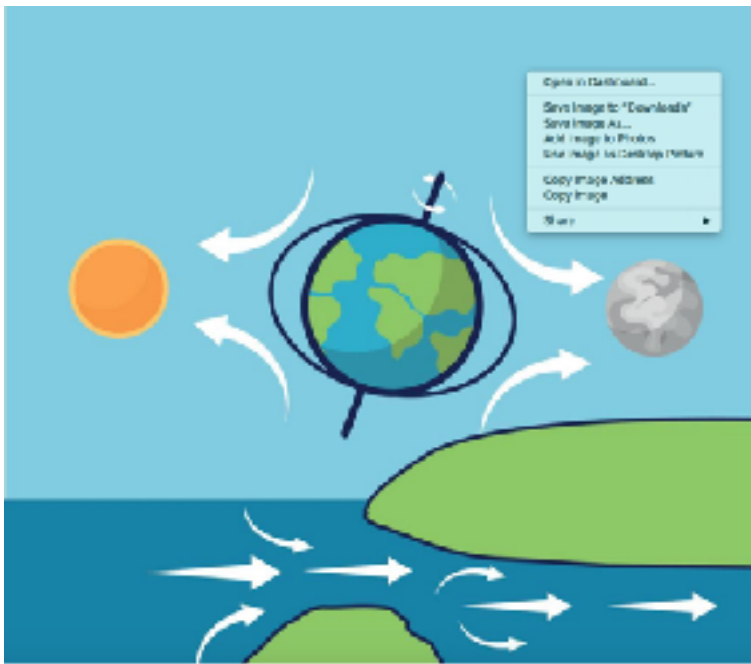


Eddy Line: The boundary between the primary downstream current and the secondary upstream current.

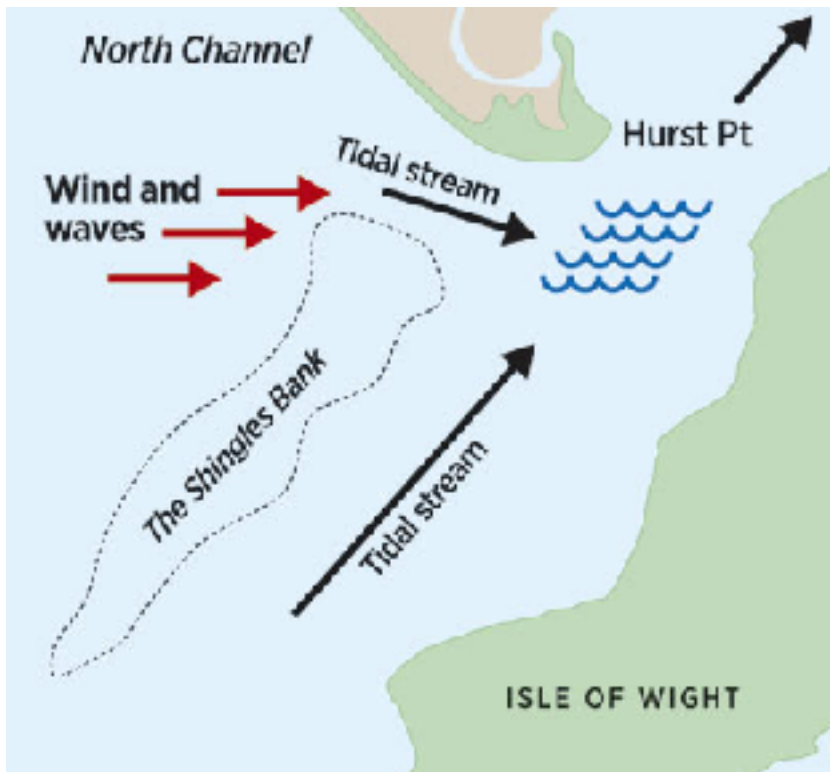


Tidal Streams:

This is the horizontal flow of water that is produced by the forces of the moon, the sun and the Coriolis effect of the earth turning on its axis. It is also often called tidal current. It is the main movement of water (stream) that is unobstructed by the friction of land it is running alongside. As it picks up speed from being squeezed between two bodies of land; it is called tidal race.



Overfalls: This is a turbulent section of water caused by strong current passing over submerged ridges



This diagram of an overfall wave may be a bit easier to understand when you can view Shingles Bank under the surface and the wind and waves are then push over top of the bank creating a overfall waves. **Tidal Race** is accented in Blue where there is a swift movement of tidal water through a narrow channel. When two tidal streams meet you get tidal race and increased overfall waves.

Whirlpools: This is a whirling circular movement of water created when the tide turns.



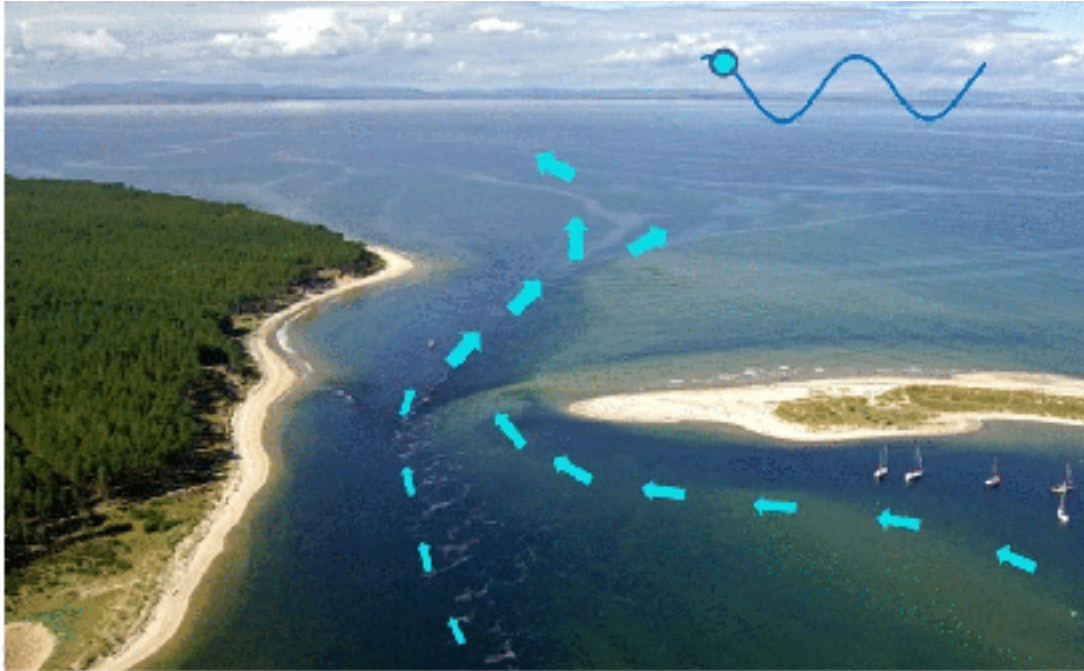
A Standing wave is a wave that remains in the same place and can be caused by water running downstream meets an obstruction or when current that is decelerating meets current that is moving faster. There are some great standing waves in Skookumchuk rapids off Egmont in the sunshine coast. There will be a video to watch shortly on a standing wave in England



River Eddy Turn: Sometimes it is hard to see the distinction of the eddy lines when the standing waves inside the back eddy are almost the same size as those on the eddy line. The white water in this photo makes it hard to distinguish that he is turning shortly into a back eddy.



Look at the Blue Arrows and see how it is showing tidal movement of water. What would you say this photo is depicting.



Tidal streams would be the correct answer. See how the water picks up speed as it is pushed through narrow gaps underwater or over the shallower banks.