PUBLIC SAFETY & AQUATIC RESCUE TRAINING MANUAL

35th EDITION

Module 4: Surf Awareness

Table of Contents

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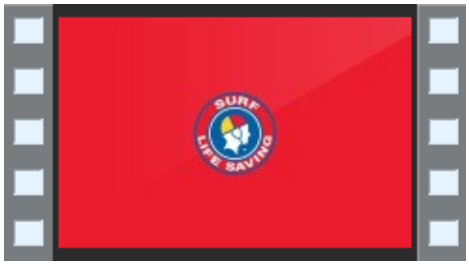
Surf awareness

The coastal environment is highly dynamic, with constant changes to beaches, sandbanks, waves, winds and currents. While on patrol, you should regularly monitor hazardous surf conditions that increase the risk to the public. For example, falling tides may increase the speed of rip currents, a wind change may see more stingers washing ashore, or a long swell period may signal danger for unwary rock fishermen. The ability to forecast, translate and prepare for changing environmental conditions is a valuable skill.

Rip currents are a particularly significant hazard since they are the cause of the majority of rescues and coastal drownings each year in Australia [1]. Learning how to identify rip currents, ascertain their flow behaviour, manage public interaction with them and use them to assist you are vital lifesaving skills.

As a lifesaver, you will need to develop the key skill of reading the surf conditions, which change in a very short period of time due to changing tides and weather conditions. For your safety and that of your team, you should always spend time looking and reviewing the conditions before entering the water.

Wave formation



Formation of Waves Video

Wind energy to wave generation

The atmosphere is constantly rearranging itself into areas of high and low pressure due to a range of factors. Air is accelerated in the form of wind from areas of high pressure to areas of low pressure. The greater the pressure difference (or gradient) between the two areas, the stronger the wind will be. In the Southern Hemisphere, winds circulate clockwise around low pressure, and anticlockwise around high pressure. These winds are the driving force in wave generation.

The charts below show the relationship between pressure systems and wind. The synoptic chart (top) shows high- and low-pressure areas, with lines connecting areas of equal pressure (isobars). You can see how these pressure systems are reflected in the wind patterns shown in the chart underneath. The closer the lines on the synoptic chart, the greater the wind speed and therefore wave strength and height.

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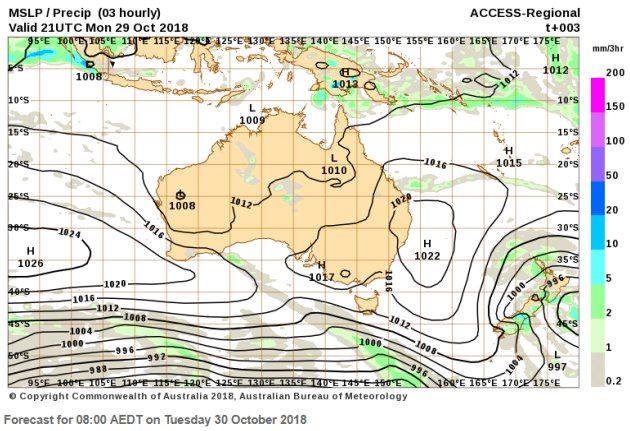


Chart 1 – Interactive weather and wave forecast [2]

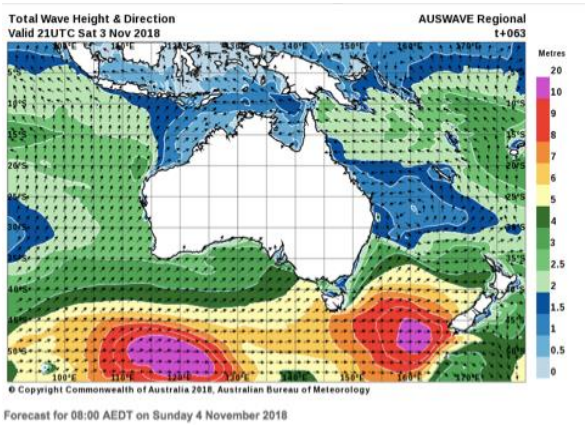


Chart 2 – Total wave height and direction forecast [3]

Swell propagation and characteristics

Swells are formed by the wind blowing across the surface of the ocean.

The size of the swell is determined by three factors.

1. Strength—the intensity of the wind.
2. Duration—the length of time the wind blows.
3. Fetch—the distance over which the wind blows.

The longer and stronger the wind blows, and the greater the distance over which it blows, the larger the swell pattern will be as it travels across the ocean. This process is called swell propagation. At this stage, swells take on a distinct set of characteristics.

The following swell characteristics can give useful information to the lifesaver when assessing surf conditions.

- Swell period—the time (measured in seconds) between swell crests. Swells with a high period (longer time) indicate increased strength of the waves when breaking and increased time between sets.
- Significant wave height—the vertical distance (measured in metres) between the crest and the preceding trough of a wave that is about to break. It is indicative of the size of the wave face.
- Swell direction—the compass direction from which the swell is coming. Coastline that is more exposed to the incoming swell direction will experience larger surf conditions than more protected areas.

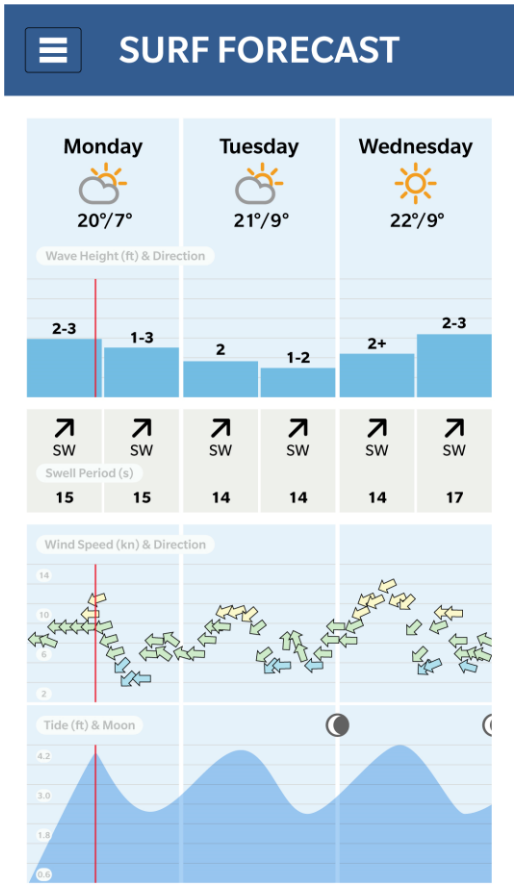
Swells can retain their energy over long distances. They reach saturation when a balance is reached between the generating force (wind) and the limiting force (gravity). They are also limited by loss of energy through white-capping (aka ‘white horses’).

Surf forecast

Surf forecasts for offshore swell conditions are quite reliable, but they require significant translation with an understanding of local environments to accurately predict conditions on any beach.

A variety of organisations provide marine forecasting services, including Surf Life Saving, Coastalwatch and the Australian Bureau of Meteorology. The key information provided includes significant wave height, swell period, swell direction, wind speed and wind direction.

Routinely accessing this information before commencing your lifesaving duties allows for additional preparation for hazardous conditions if necessary. The SLS *Beachsafe App* allows you to look up the specific surf forecast at the beach you are heading to.



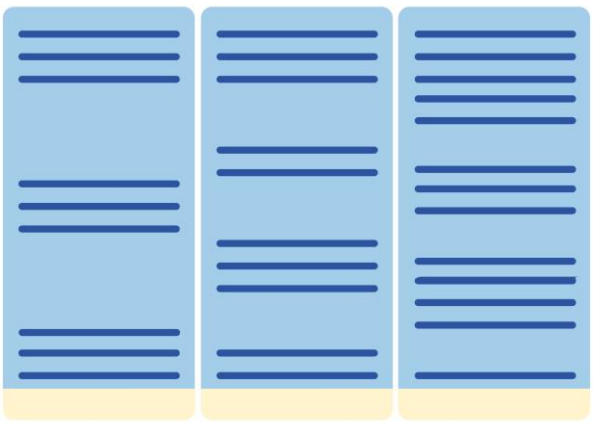
Wave grouping

Swells form into a regular pattern of larger and smaller groups of waves. The largest waves in this pattern are called sets, and the smaller waves are referred to as lulls. The number of waves in a set and the duration of the lull between sets is generally consistent within a given swell but varies between swells.

From one set to the next, waves in the set are generally consistent in their size relationship. In a three-wave set, for example, the size relationship may be as follows:

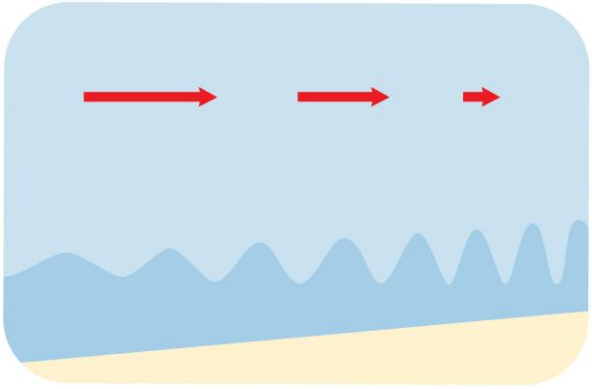
- smallest
- medium
- largest.

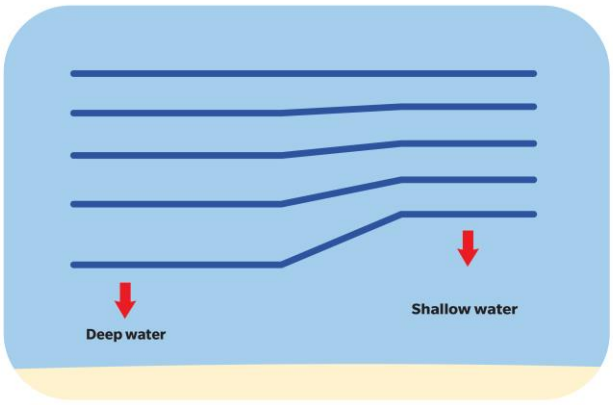
A lifesaver can avoid negotiating larger set waves and get out to sea more easily (and faster) by timing the lull and using the rip current, which can flow faster, or ‘pulse’, following a set.



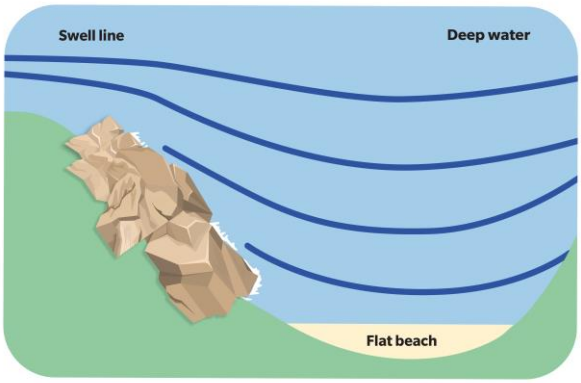
Swells interacting with the coastline

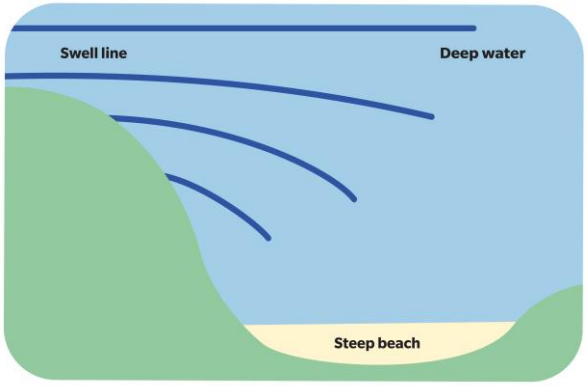
As a swell approaches land, it interacts with the shape of the coastline and the underwater geography (bathymetry). This process is highly variable, depending on the coastline. As the swell approaches shallow water, it becomes larger and slows down, shortening the swell period. This is called shoaling.





Swell energy can become focused on one shallow area and break with immense power, such as on a reef ('focusing') or spread out over a wider area such as a bay ('defocusing'). Tidal movements can exaggerate the effect of swell focusing over sandbanks, reefs and rock platforms. When the water depth becomes shallow enough, the crest of the swell starts moving faster than the base of the trough, resulting in breaking waves.





Wave profiles

Plunging waves—break with tremendous force and can easily throw a swimmer to the bottom. They usually break in shallow water. Low tides can increase the frequency of plunging waves. This wave type can be dangerous and is a common cause of spinal injuries.

Plunging waves may develop into 'back-blasting waves', which forcefully blast water and sand out the back of the wave when the sandbank is very shallow. They are the most hazardous type of wave.

A plunging wave that breaks directly on, or very close to, the shore is often called a 'shore break'. This happens when the beach is very steep at the shoreline.

Spilling waves—occur when the crest (or top) of the wave tumbles down the face (or front) of the wave. Generally, spilling waves are the safest wave type for swimmers.

Surging waves—may never actually break as they approach the shore. These waves are commonly associated with rock ledges that face into deep water. Surging waves do not lose speed or gain height and can knock people off their feet and carry them back into deep water. For this reason, they can be very dangerous, especially around cliffs, rock ledges and breakwaters.

Tsunamis

A tsunami is a series of ocean waves with very long wavelengths (typically hundreds of kilometres long), caused by large disturbances of the ocean floor. These disturbances are most commonly undersea earthquakes, but could also be landslides, volcanic eruptions, explosions or meteorite impacts. They have the potential to cause disastrous inundating waves, however Australia usually experiences their effects only as dangerous rip currents and unusual tidal variations. These variables are reflected in the tsunami warning levels issued by *The Joint Australian Tsunami Warning Centre*.

- **No threat**—an undersea earthquake has been detected; however, it has not generated a tsunami, or the tsunami poses no threat to Australia and its offshore territories.
- **Marine and immediate foreshore threat**—warning of potentially dangerous rip currents, waves and strong ocean currents in the marine environment and the possibility of only some localised overflow onto the immediate foreshore.
- **Land inundation threat**—warning for low-lying coastal areas of major land inundation, flooding, dangerous rip currents, waves and strong ocean currents.

Refer to the Australian Institute for Disaster Resilience (AIDR) for more information about planning for tsunamis.

Local winds

Although large wind patterns out to sea contribute to the generation of swell, local winds affect the ocean surface conditions in the surf zone and how the waves break. Local winds (measured in km/h or knots) are generally described in two ways:

- **Offshore winds**—blow from the land towards the ocean. They generally result in a smoother ocean surface.

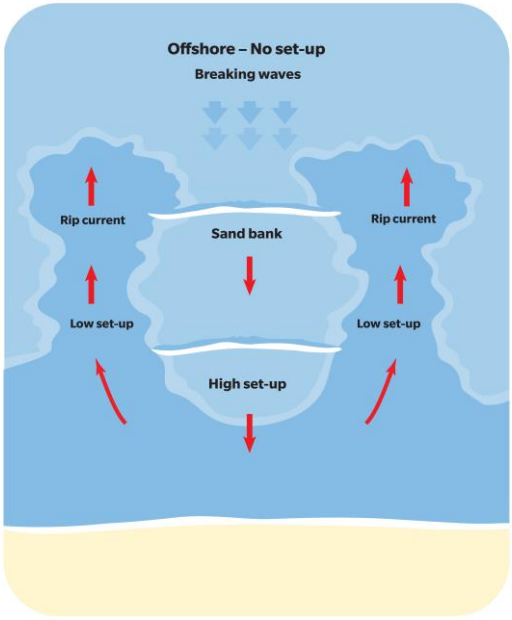
- **Onshore winds**—blow towards the land from the ocean. They generally result in turbulent ('choppy') conditions and spilling waves. These are commonly called 'sea breezes'.

Surf zone currents

The area between the breaking wave furthest out to sea and the shoreline (or, in the case of an offshore reef, where waves dissipate) is called the surf zone.

As waves break over a sandbank, the water surges upwards, creating a region of water that is higher than mean sea level (MSL). This water needs to return back to MSL due to the effect of gravity. It does this by flowing into deeper channels in the surf zone that can run along a beach and offshore. The depth of water above MSL is called the 'set-up'. As the set-up increases, the pressure on that water to return to MSL increases, and this can result in faster flow rates in longshore and rip currents.

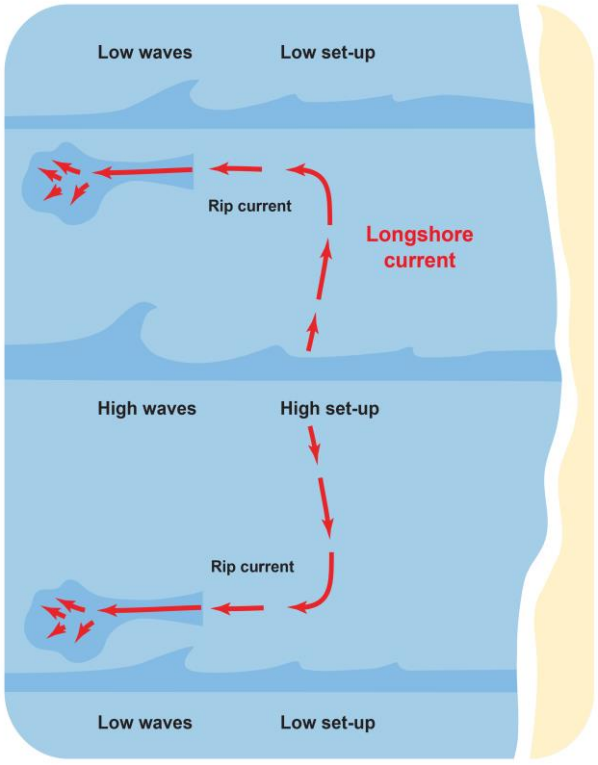
Offshore, there is no set-up; sea level is at MSL. On a sandbank, set-up is high and gravity has a strong effect on the water that is above MSL. The effect will be to push water through rip currents and other channels that have a lower set-up.

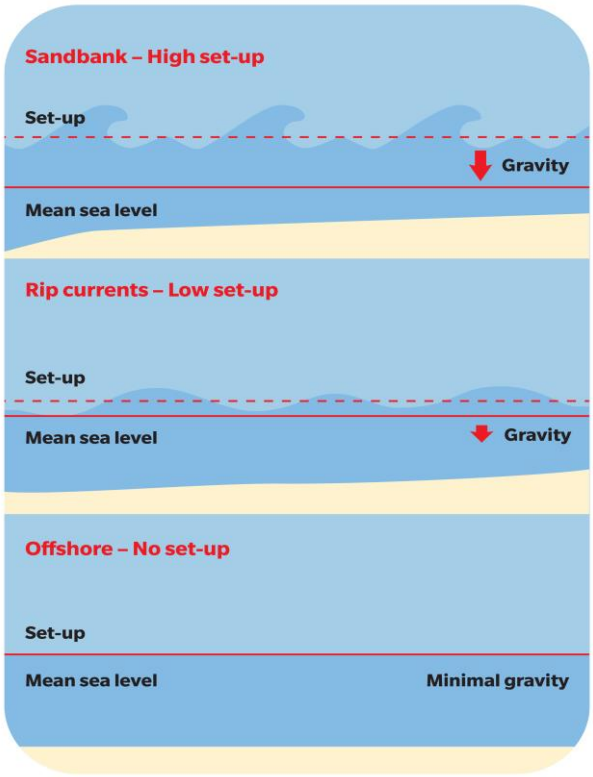


Longshore currents

A longshore current (aka 'littoral current') flows approximately parallel to the shore. Their direction is determined by both the prevailing wave direction and the shape of the sand below the water. The current ranges from fast flowing to barely noticeable. The intensity of the current is usually greater inside the surf zone.

The longshore current may produce a series of holes or gutters behind the waves breaking on the shore. They can pose a major hazard for unsuspecting swimmers, particularly small children. These currents generally feed into a rip current, which can then drag weaker swimmers out to sea. In these cases, they are commonly called 'feeder' currents.





Rip currents

Water built up at the shoreline needs to flow back out to sea. This can occur by the water flowing directly out to sea or along longshore channels into deeper channels that take water out to sea beyond the surf zone. These outward currents are called rip currents.

Rip currents are highly complex and dynamic systems. Rip currents are extremely variable and change in character as a result of the underwater topography, the size and intensity of waves, the direction of waves and depth of water. Rip currents will change quickly depending on tide and changing wave conditions. Different types of rip currents can exist on the same beach and often in close proximity.

Rip currents contribute to the majority of surf zone drowning deaths each year. Once caught in a rip current, survival requires a range of aquatic and decision-making skills, so avoiding them should be encouraged and promoted.

Identifying rip currents

How to identify a rip current is an important skill that surf lifesavers need to develop—and it is not an easy skill to master. In 2018, research revealed that most beachgoers are not confident in identifying rips and that the majority of confident people are not able to identify rips correctly [4].

Wind and water movement can make it extremely difficult to know exactly the characteristics of each particular rip current's speed, strength and direction. From the shoreline, you may not be able to determine if the current is circulating in the surf zone or extending out to sea. You may need to view the rip current from an elevated location to have a better understanding of its characteristics.

Five common signs of a rip current are [5]:

- deeper, darker-coloured water
- fewer breaking waves
- a rippled appearance, surrounded by smoother water
- debris floating seaward
- foamy or discoloured sandy water extending beyond the surf zone.

Rip currents may not necessarily show all five signs at once and may have only one or two of these signs.

Public education about rip currents is an essential element in reducing the rate of drowning. At every opportunity, lifesavers should educate the public to pause and review the surf conditions before entering the water, taking time to identify and avoid rip currents.

Types of rip currents

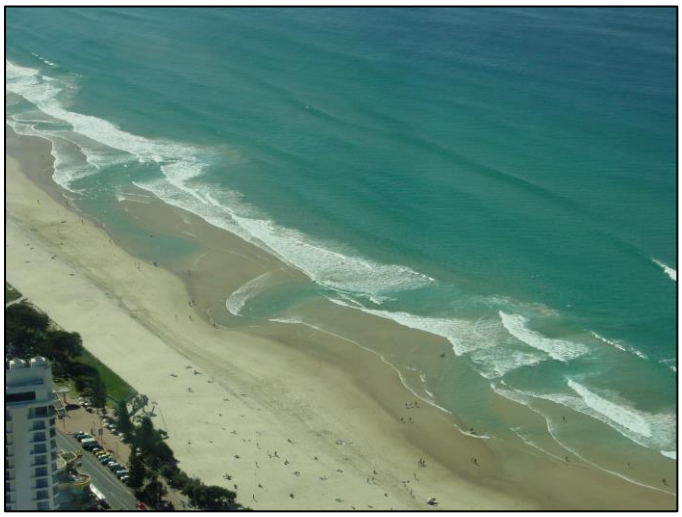
There are three common types of rip current [6].

Topographic rip

A topographic rip current will remain in the same area for months or even years. This is due to permanent features such as rock groynes, reefs, headlands, drainage pipes or permanent structures, such as a pier or jetty.

Fixed rip

Fixed rip currents are generated by a semi-permanent hole or gully on the sandy ocean floor. Once established, a fixed rip may last from several hours to many months. The length of time depends on the ocean conditions and the resulting movement of the sand.



Flash rip

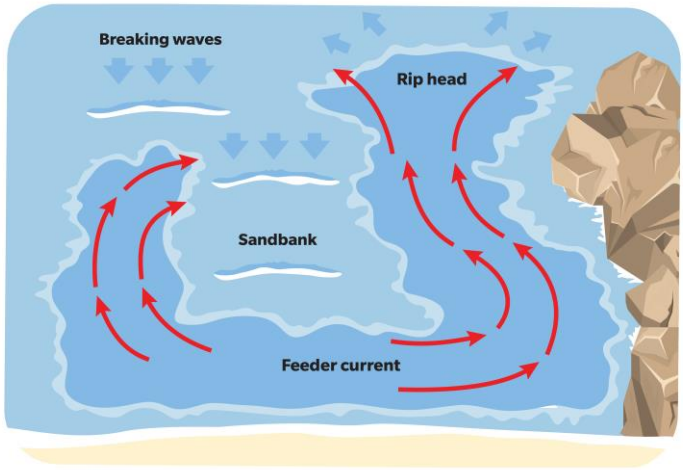
The flash rip current is temporary in nature for any given location. It is caused by a large surf build-up in a short period of time, which increases the volume of water above mean sea level. Flash rip currents appear suddenly, usually without warning. The seaward pull may be intense and is relatively short-lived.

Flow behaviour of rip currents

Rip current flow behaviour can also be highly variable, again depending on the local geography and the surf conditions. Flow behaviour can include [7]:

- a regular flow dispersing in a ‘rip head’ just beyond the surf zone
- circulating eddies within the surf zone
- short episodic ‘pulses’ forcing water to exit the surf zone following a set of waves
- water and sediment being carried up to 1–2 km out to sea during surf conditions with waves higher than about 3 m; these are commonly called ‘mega-rip currents’.

Multiple types of flow behaviour can occur in any type of rip current. Flow patterns can change rapidly as surf conditions change.



A common feature of many rip currents is that they occur in deeper channels. The deeper water means people can lose their footing and move with the current offshore. Rip currents can flow at up to 3 m per second, which is significantly faster than most people's swimming ability. This is why trying to swim against a rip current can be potentially very hazardous.

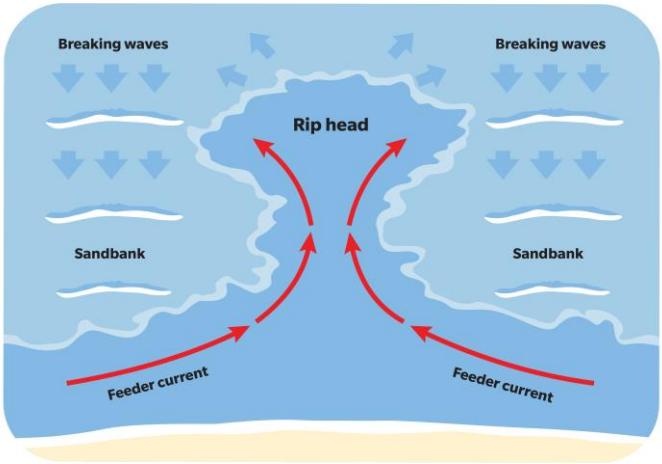
Both circulating and non-circulating rip current systems can be operating on the same beach at any given time, based on a number of factors such as topography, bathymetry and swell conditions.

Circulating rip currents

Rip currents can form circulating eddies within the surf zone, where water flows offshore and is then deposited on the adjacent sandbank before returning towards the shoreline where the cycle is repeated. Occasionally, circulating systems 'pulse' and expel water just beyond the surf zone that does not recirculate.

Non-circulating rip currents

These commonly occur when the sandbanks and rip current channels are very well defined. The water flows offshore through the rip current before dissipating just beyond the surf zone in a 'rip head'.



Rip current avoidance principles

Rip currents are an important consideration when setting up a patrol. Red and yellow flags should also be placed adjacent to a sandbank. Warning signage and rescue equipment such as boards, rescue tubes and fins should be placed adjacent to rip currents, since these are areas where people are highly likely to require assistance.

Reducing the public's exposure to rip currents is the primary intervention to reduce the drowning rate related to rip hazards. This can be achieved by people swimming between the red and yellow flags, following safety signage instructions and learning how to identify rip currents.

Rip current survival principles

Because rip currents are a dynamic and variable hazard, survival once caught in a rip current can require different responses, or sequence of responses, for any particular situation. A common myth is that rip currents will pull you down. This is incorrect. A rip current will only pull you through the water either circulating you back to the surf zone or out to sea. People can drown because they attempt to swim against the rip current for too long, become exhausted and are then unable to stay afloat until they return to shallow water or are rescued. When caught in a rip current it is important to remain calm, do not panic, conserve your energy and consider your options.

The viable options available to a swimmer caught in a rip current are described in the rip current survival principles flow chart.

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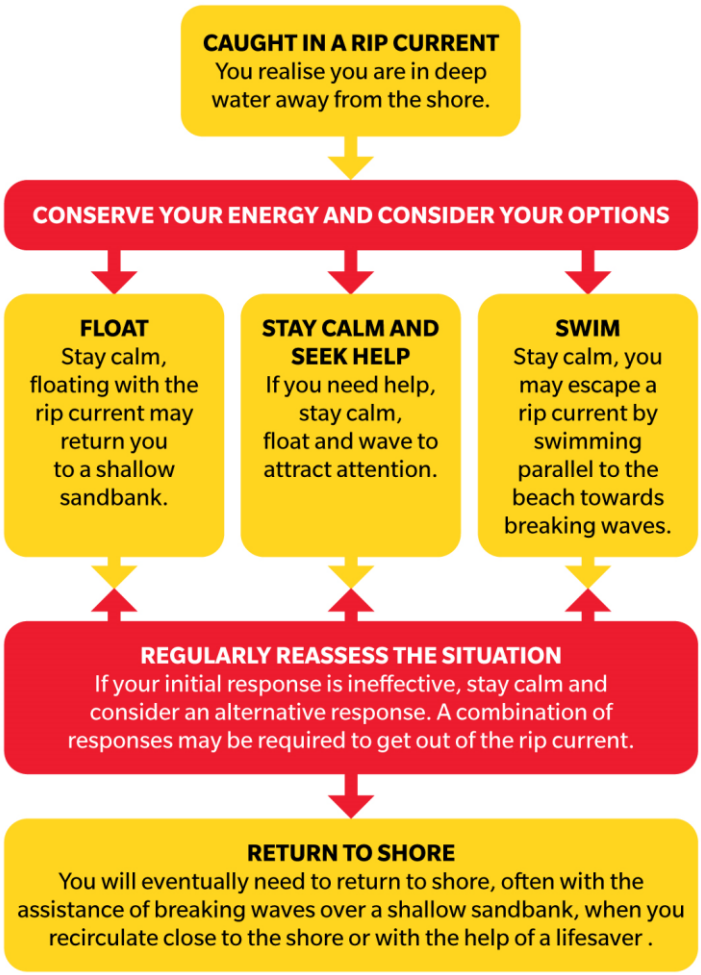


These survival principles apply to a majority of complex scenarios a person may experience when caught in a rip current. Successful escape from a rip current may require a combination of responses if the initial response is ineffective. Some idealised examples are provided in Table 1 below.

Swimmer	Initial reaction	Reassessment	Considered action	Reassessment	Reconsidered action	Return to shore
1	Float	Floating further out to sea	Float Signal for assistance	Floating alongshore towards sandbank	Float Signal for assistance	Regain footing, walk back to shore
2	Swim parallel (in one direction, e.g., south)	No progress made; tiring	Swim parallel (in the other direction, e.g., north) Signal for assistance	Significant progress made	Swim parallel (north) Signal for assistance	Regain footing, walk back to shore
3	Swim parallel (in one direction, e.g., east)	No progress made; tiring	Float Signal for assistance	Lifesaver/surfer sighted en route to assist	Float Signal for assistance	Return to shore with assistance of lifesaver/surfer
4	Swim parallel (in one direction, e.g., west)	No progress made ; tiring	Float Signal for assistance	Exited the surf zone	Swim parallel to the beach and towards the breaking waves Signal for assistance	Return to shore with the breaking waves

Table 1—Examples of how to apply the rip current survival principles

Despite the inherent complexity of rip current survival for inexperienced surf swimmers, rip currents can be useful tools for lifesavers and surfers who use their offshore flow to quickly and efficiently negotiate the surf zone and access victims.

Tides

The gravitational pull of the Moon and the Sun causes tidal movement in the Earth's oceans and seas.

On any specified tidal day, high tide is the highest of the high waters and low tide is the lowest of the low waters. Tides either rise or fall in the period between high and low tide. Mid-tide is the medium between the high and low tide.

High tide generally occurs twice in a 24-hour period; however, this may vary for a location during any given week or month.

Tide can affect a variety of conditions and hazards in the surf zone, which the lifesaver should be aware of:

Hazard	Rising to high tide	Falling to low tide
Rip currents	Generally slower flow speeds	Faster flowing water and greater definition of rip current channels
Rock platforms	Waves overtopping higher up the platform, more dangerous for rock fishing	Intertidal zone out of water, greater exposure to slippery moss and algae
Sandbanks	More water over the sandbank, generally better for swimmers	Less water over the sandbank, higher danger of spinal injuries
Waves	Spilling waves, good for learning to surf and bodysurf	Plunging waves, dangerous for novice surfers and swimmers

Table 2—Effects of tide on hazards in the surf zone

It is recommended that lifesavers are aware of tidal movements specific to their lifesaving service area. The SLS *Beachsafe App* allows you to look up the specific tide conditions at the beach you are heading to.

Beach types and hazard ratings

Beaches can generally be described as being one of five basic types. This section describes these beach types and the characteristic hazards associated with each.

Beaches can change to a different type as seasons change. A reflective beach in summer could be a bar and rip beach in winter. Changing weather, tides and wave conditions can also mean that a beach changes from one type to another within a few hours. Correctly identifying beach types can help the lifesaver to assess the hazards that may be encountered on a particular beach, the relative safety of the beach and the actions that may be needed to protect beachgoers at any given time.

Types and safety issues

Beach types are generally determined by their length and topography (both of the beach and underwater). However other factors such as orientation and whether they are sheltered from the prevailing conditions by natural features such as headlands and reefs will have a major impact on the hazard rating and safety issues for a particular beach.

Reflective

Wave pattern

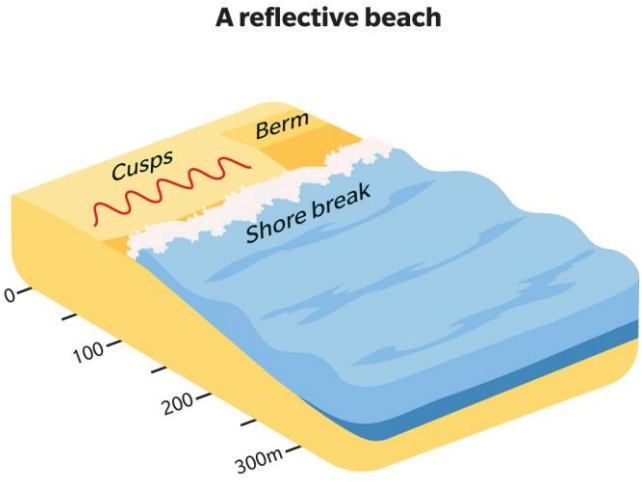
- Low wave size—up to 0.5 m
- No surf zone
- Relatively strong and fast surging or plunging waves at the shore break

Hazards

- Rip currents may occur—they tend to be short-lived
- Surging waves and deep water close to shore present hazards for children, the elderly and weak swimmers

Risk assessment considerations

- Risk of spinal injuries in higher wave conditions
- Supervision is needed for children and weak swimmers
- Swimmers and bodysurfers must watch out for the shore break
- There is a strong pull from the beach into the water
- There is no sandbar and the water is deep close to shore



Side veiw of a reflective beach

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Low tide terrace

Wave pattern

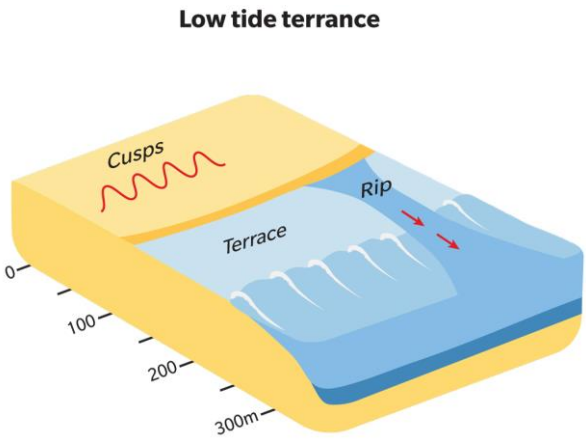
- Relatively low wave size—between 0.5 m and 1 m
- Sometimes breaking on outer edge of sandbar; waves may cross the sandbar unbroken at high tide and break on the beach face
- Plunging waves develop in higher wave conditions

Hazards

- Higher wave conditions present the risk of spinal injuries
- Shallow and weak rip currents may develop with some wave conditions

Risk assessment considerations

- At high tide the sandbar may be covered by deep water, with rip currents and a 'shore break'
- Incoming tides may trap unsuspecting swimmers on sandbars
- This beach often has tidal currents, which increase the level of risk



Side veiw of a low tide terrance beach

Bar and rip

Wave pattern

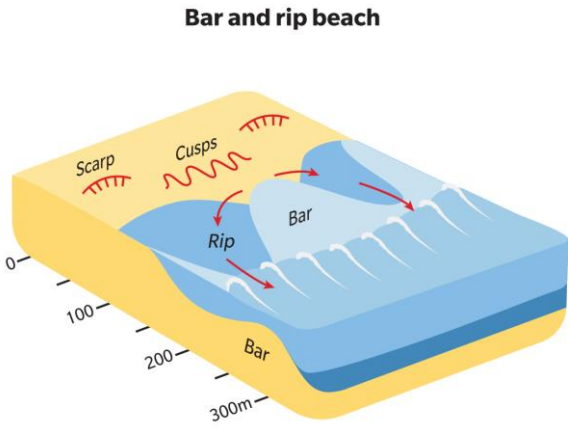
- Wave size between 1 m and 1.5 m
- Waves break on the sandbar, then move shoreward and sideways in the longshore or literal currents

Hazards

- Inexperienced and weak swimmers are tempted into the water onto sandbars when they see people standing in shallower water
- Rip currents are stronger at low tide
- Sandbars are in close proximity to deep channels and hazardous rip currents

Risk assessment considerations

- Multiple flagged areas may be required
- Supervision of children and weak swimmers is needed
- Swimmers may be caught in rip currents
- Waves can wash swimmers off the edge of the sandbar into rip currents



Aerial schematic of bar and rip beach

Longshore trough

Wave pattern

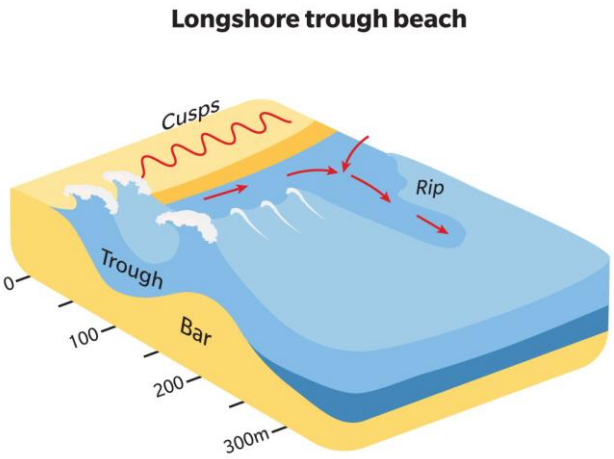
- Wave size of 1.5 m or more
- Waves break on the sandbar, re-form in the trough and surge up the beach face

Hazards

- Deep water in trough close to shore

Safety points to emphasise

- A strong ‘shore break’ is common
- Deep water is found in the trough close to shore
- It is difficult for swimmers to return to shore
- Rips and currents occur in the troughs
- Strong surf is found on sandbars
- Waves tend to be stronger and larger



Aerial schematic of Longshore trough beach

Dissipative (broad surf zone)

Wave pattern

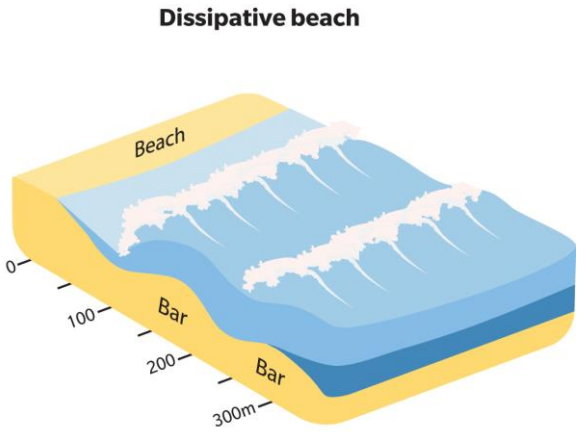
- Highest wave energy beaches in Australia
- Waves greater than 2.5 m high
- Very wide surf zone
- Waves begin on an outer sandbar, reform in a trough and break again on an inner sandbar
- Rip currents occur in inner surf zone

Hazards

- Very big seas, so most people do not consider swimming in these locations

Risk assessment considerations

- High waves run across the beach
- Rip currents occur and may take swimmers out to sea
- Strong waves and currents are found in the trough and outer surf zone
- These beaches are often produced by storm conditions
- They are suitable for strong, experienced swimmers only



Side veiw of a dissipative beach

Beachsafe App

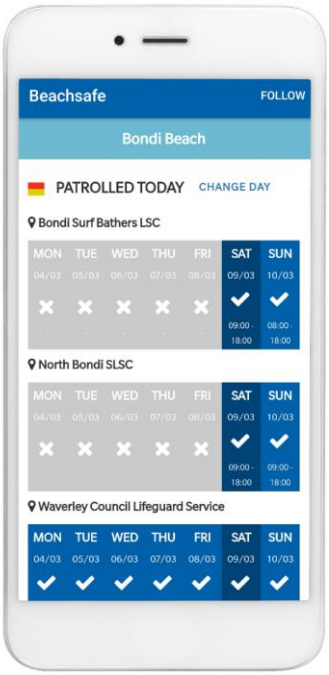
Beachsafe provides detailed information on more than 11,000 beaches around Australia. The SLS *Beachsafe App* allows you to look up the specific local conditions at the beach you are heading to. It provides details of each beach including:

- beach location and nearby beaches
- known hazards
- patrol status
- swell conditions
- tide conditions
- UV index
- water temperature
- weather forecast
- wind conditions.

The app also provides a general beach hazard rating, for each beach as follows:

- least hazardous: 1–3
- moderate hazardous: 4–6
- highly hazardous: 7–8
- extremely hazardous: 9–10.

This rating provides an assessment of the likely conditions. However, the prevailing surf, tide and weather conditions may change the hazard ratings. Always check and make your own assessment of hazards prior to entering the water.



Surf skills

An important skill for all surf lifesavers to develop is negotiating at least moderate surf conditions, either by swimming or using rescue equipment. Initially, you will need to learn and practise new skills in calm conditions, or in conditions with which you are comfortable. You should attempt more challenging conditions only when you are confident and familiar with rescue equipment.

Always note the prevailing conditions such as wind, rip currents, tides and wave conditions, and use them to your advantage.

Self-survival skills

Self-survival skills are an important way of minimising risk to a lifesaver. These skills include your ability to use rescue equipment to provide flotation for yourself and a victim.

Floating

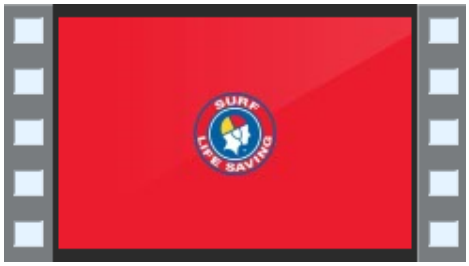
Learning to float on your back allows you to keep your body buoyant while conserving much-needed energy. Your personal buoyancy will depend largely on your individual body composition. People with large amounts of muscle mass and dense bones are typically less buoyant. Wearing a wetsuit will often increase your ability to float, while some forms of clothing can have the opposite effect. Flotation aids such as rescue tubes or lifejackets can assist your buoyancy.

You can float by:

- lying on your back with your body fully extended
- keeping your head in line with the rest of your body
- keeping your head, torso, upper legs and feet at the surface
- keeping your legs straight
- keeping your body in this buoyant position by doing a sculling motion with your hands.

It is important to remember that when floating, you will drift with the prevailing currents.

Treading water

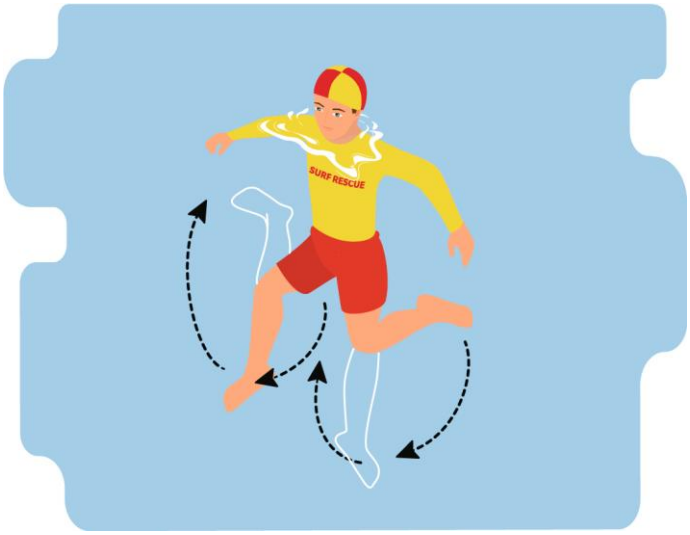


Video – Treading water

Treading water is an effective method of being able to stay in one position with your head above water for extended periods of time.

You can tread water by:

- maintaining an upright body position
- using a sculling motion with your hands and kick with your feet.



Before entering the surf

For your safety it is important to review the surf conditions prior to entering the water and plan a course to the victim in the case of a rescue. The following are considerations of particular importance.

- **Landmarking**—make note of a fixed landmarks (such as a sign, a building or a tall tree) that can be seen from the water, and use these as a guide for maintaining your position through the surf zone.
- **Lulls**—time your entry into the surf to coincide with your swim through the surf zone, especially the 'breaker line', with a lull between sets.
- **Other users**—review other surfers' possible impact on you and your safety. Avoid swimming out through the break zone as swimmers, boardriders, surfers or beachgoers may not see you if obstructed by waves or white water.
- **Rip currents**—review the location and strength of rips along the beach for any need to change your course to the victim. Use a rip current as a means of quickly getting out beyond the surf zone faster if it will not take you off course to the victim.
- **Sandbanks**—identify the location of sandbanks and their distance from the shoreline. Calculate whether you could reach the victim faster and conserve more energy by using a sandbank instead of a rip current.

Surf swimming

Practice swimming in a variety of surf conditions, especially choppy water and white water. Because white water is aerated, you will experience less flotation and 'grip' in the water. There are various skills involved in surf swimming, including wading, dolphin diving and bodysurfing.

Wading

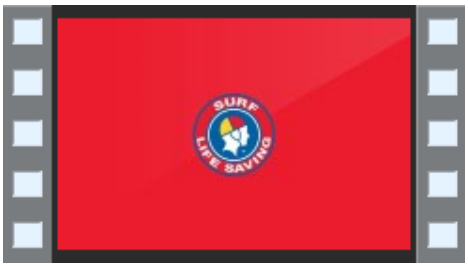
Video – Wading

Negotiate the shallows using a high hurdle type of stride to cross shallow sections. This is achieved by lifting your knees and legs high and to the side.

When you reach a depth where your wading progress is slowed, begin dolphin diving ('porpoising') or swimming as necessary.

Dolphin diving

This technique helps preserve your forward momentum against the effect of waves trying to push you back to shore.



Video – Dolphin diving

Follow the steps below to dolphin dive in flat water:

1. Dive forward from waist-depth water with arms outstretched to the sea floor.
2. Grab the sea floor as you bring your feet and hands together.
3. Push off the sea floor with your feet, maintaining your forward momentum to repeat another diving movement.
4. Take another breath as you exit the water and complete another dive.
5. Repeat the process until you reach a depth where your progress is slowed.
6. Check the conditions ahead and start swimming.

This process can be varied for small, medium and large wave conditions.

Small broken waves

1. Dive over the top of the wave with arms outstretched to minimise the risk of spinal injury.
2. Stand and continue dolphin diving or start swimming.

Medium to large broken waves

1. Dive under the wave with arms outstretched before the white water reaches you, giving you time to reach the sea floor.
2. Lie as flat as possible and dig your hands into the sand while the wave surge passes over you.
3. Pull forward, draw your legs up under your body.
4. Push off from the sea floor to the surface.
5. Check surf conditions ahead.
6. Start swimming again.

Large surf and deeper water

1. Dive below the surface before the white water reaches you. You may not be able to reach the sea floor.
2. Wait for the wave surge and turbulence to pass over you.
3. Swim to the surface.
4. Check surf conditions ahead.
5. Start swimming again or wait for a lull.

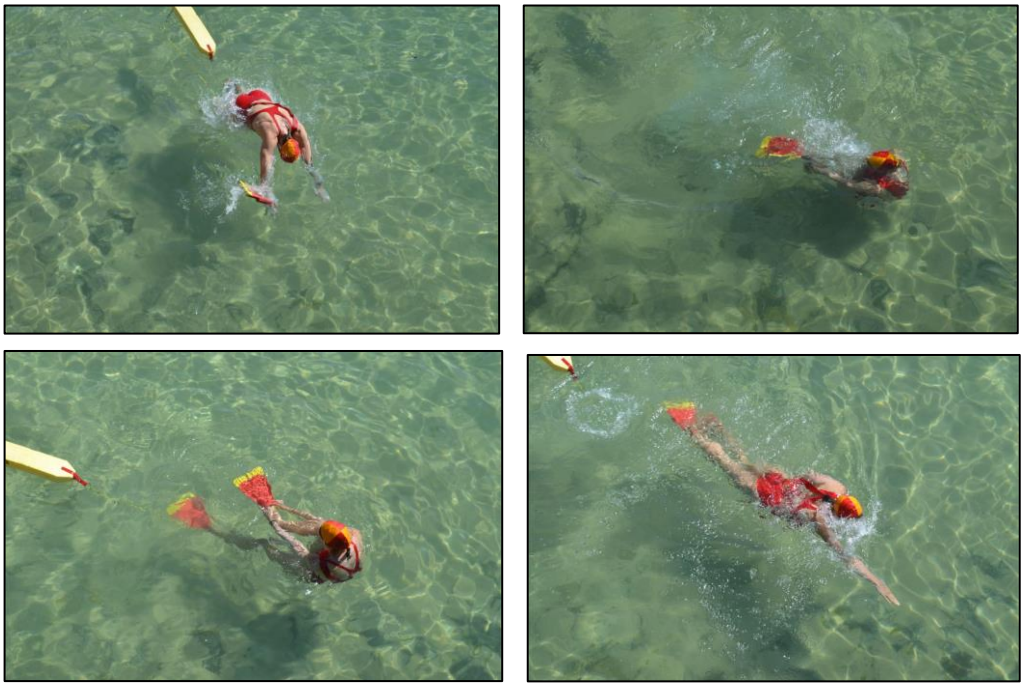
Effective use of swim fins

Video – Swim fins

Swim fins increase your ability to quickly reach and return a victim to shore. They should be stored and carried with rescue tubes at all times. Follow the steps below to put fins on effectively while entering the water.

1. Wade into the water with the rescue tube in one hand and swim fins in the other.
2. Dolphin dive until it is too deep to continue, or it is more effective to swim.
3. Roll onto your back and put on the swim fins during your final dive.
4. Roll back over and continue swimming through the surf zone.

Note: Swim fins enhance your performance when swimming with a rescue tube. Practising placing fins on quickly and swimming within the surf zone will develop your skills to perform tube rescues.



Bodysurfing

Video – Body surfing

Spilling waves are the best for bodysurfing. If you catch a plunging wave, injury can be avoided by pulling out or dropping off the back of the wave before it breaks.

Follow the steps below to bodysurf.

1. Push off the sea floor or start swimming towards the shore when the wave is almost upon you and until you feel the wave begin to lift and carry you.
2. Take a breath as you put your head down and kick hard as the wave breaks until your body breaks through the wave. Your feet should be together, your back arched slightly and your arms extended in front of you to minimise the risk of spinal injury.
3. Tilt forward and surf along the face of the wave as the wave becomes steeper.
4. Use arm strokes and maintain your kick to hold your position on the wave. Try to keep your body straight.
5. Pull out of the wave as you approach the beach by turning your body away from the wave's breaking force.

Note: Using swim fins increases your propulsion through the water and makes catching waves much easier.

Rescue board paddling

The rescue board is an essential and versatile piece of rescue and water safety equipment. Board paddling requires balance, strength and endurance as well as wave-catching skills.

To develop board paddling skills, you should practise using rips when entering the water and negotiating waves in calm water or small surf before attempting larger surf or a rescue. Practise paddling a board regularly, as the skill can be lost over time.

Entering the water

When entering moving water, especially in 'shore break' conditions, care must be taken to avoid injury or losing your grip on the rescue board.

As you move forward from the shore and into the water, you should either:

- hold the board at your hip with the nose slightly raised
- drag the board by holding the strap closest to the nose.

Note: Excessive dragging may damage the board.

If there is a longshore current or a strong wind, always hold the board at your side so that the prevailing conditions carry the board away from you, rather than allowing the board to be pushed onto you. Try and maintain control of your board where possible.

Follow the steps below to enter the moving water with a board.

1. Place your board (deck/straps up) on the water while holding on to the straps on both sides.
2. Approach the board from the side; ease your chest onto the board while still holding the straps.
3. Slide your legs onto the deck.
4. Lie down on the board (the prone position). Check the nose of the board is not 'nosediving' or lifted too high, and pull or push yourself up or down the board to 'trim' the board.

The timing of entry is very important where there is a 'shore break'. Wait for a lull and, at the right moment, run into the water, lie on the board and start paddling without stopping or losing momentum. This combination will move you and the board forward through the break zone effectively and is often much safer than stopping to lie on your board and then paddling from a stationary position.

Note:

- If the water is shallow, you may need to 'bunny hop' alongside the board until you reach deep enough water to mount the board.
- You may feel more stable with your feet apart and resting on the outside of the board.

Bunny-hopping

Bunny-hopping is used to travel through shallow water quickly. This technique is more efficient than trying to paddle in white water that is knee depth.

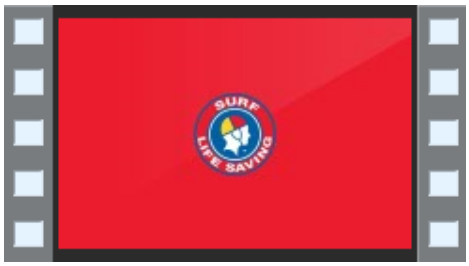
Follow the steps below to bunny-hop.

1. Place your hands on either side of the board.
2. Lift your legs as high as possible out of the water to prevent drag and put weight on your arms to maximise glide.
3. Land with the foot closest to the board slightly ahead of your other foot.
4. Push off one foot, then the other foot.
5. Jump so both feet push the board forward while putting your weight on your arms.
6. Drop onto the board once the water depth increases and start to paddle while the board glides forward.

Board trim and getting on the board

Your position on the rescue board determines the board's 'trim'. Look at the nose of the board when you are paddling. If water is constantly streaming over the nose, it is 'nosediving'. If the nose is lifted too high, it greatly reduces your speed. You may need to move regularly on the board to keep the board's 'trim' in the best location. Your trim will also need to be adjusted depending on if you are paddling away from, or towards, the shore.

Paddling technique



Video – Prone paddling

Prone paddling

This is the easiest paddling technique to master, as your centre of gravity on the board is low and this provides stability. With prone paddling, one arm is in the 'stroke phase' while the other arm is in the 'recovery phase'. Lying face down on the board, you use your arms in a similar way to the arm stroke used in freestyle swimming.

Follow the steps below for prone paddling.

1. Reach each arm, in turn, as far forward into the water as you can, entering the water with a cupped hand (the catch).
2. Push your arm deep into the water, pulling back firmly along the side of the board as far as your hip (the stroke phase).
3. Lift your elbow to bring your other arm out of the water and swing your hand forward (the recovery phase). Your elbow should remain high during recovery phase while your hand runs along the side of the board.
4. Swing your legs up and down in time with your arms. Similar to moving your arms when running, this leg action helps you paddle.

Note: While paddling, keep your chest off the board with head looking forward. This will help you switch on your core muscles. These provide you with more strength, which will move you through the water faster.

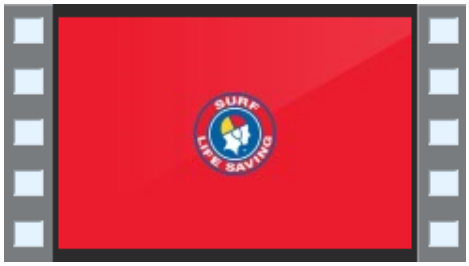
Paddling on your knees

Paddling on your knees is a skill worth developing, as it allows more muscles of the body to contribute to the stroke, generally making paddling faster and less fatiguing. It does, however, require more skill as it is more difficult to maintain your balance.

Follow the steps below to paddle on your knees.

1. Kneel on the rescue board (using the knee pads on the deck where available) while the board has forward momentum. Your knees and feet should be placed as wide as possible, to form a stable base of support.
2. Reach forward with both arms as far as possible without losing balance to take the stroke (the catch). As you improve, you will develop a longer reach for each stroke.
3. Push your arms deep into the water, pulling back firmly along the side of the board as far as your hip (the stroke phase). Your arms should pull through the water as deep as possible. Extra strength is gained in the stroke phase by using your torso as well as your arms. By doing this you are using the strength of your whole body and not just your arms.
4. Keep your elbows high as you take both arms out of the water and swing them forward (the recovery phase) along the side of the board to take your next catch.

Negotiating the surf zone with a board



Video – Negotiating the surf zone with a board

It is important that your forward energy matches the energy of the oncoming wave to maintain forward momentum, as a wave will pick you up and push you backwards if you stop. This is achieved by limiting the time in which you stop paddling while negotiating a wave or white water. There will be times where you stop and wait instead of paddling into an unsafe position in relation to a breaking wave.

In all cases, the rescue board should be positioned directly into the wave (perpendicular) to minimise resistance.

Pushing up on a rescue board

Use this 'push-up technique' to negotiate small waves.

1. Just before the wave or white water hits the front of your board, place your hands on the sides of the board and push yourself up off the deck.
2. Let the water pass between you and the board. This reduces the ability of the wave to slow you down or push you back.
3. Lie down as soon as the wave or white water passes your torso.
4. Check the conditions ahead and trim the board.
5. Continue paddling out to sea as quickly as possible to limit the wave pushing you backwards.

Rolling a rescue board

Use this 'roll technique' to negotiate medium and larger waves.

1. Use both hands to grab the straps towards the nose of the board just before the wave or white water hits the front of your board.
2. Roll the board upside down while:
   - holding the straps firmly
   - hanging beneath the board
   - keeping the board nose pulled down
   - pulling your bent arms towards your torso, which will absorb the energy of the wave.

3. Roll the board back over when the turbulence has passed.
4. Remount the board.
5. Check the conditions ahead and trim the board.
6. Continue paddling out to sea as quickly as possible to limit the wave pushing you backwards.

Note: The sooner you recommence paddling, the faster you will move through the break zone and the more energy you will conserve.



Popping a wave

This technique requires a higher level of skill and balance and should be used only for small to medium broken waves. It is commonly used on spilling waves and when negotiating white water.

Follow the steps below to pop a small to medium wave.

1. Sit up on the back of the board as the wave approaches.
2. Lean back just before the wave reaches the nose of the board. Ensure that the nose clears the top of the wave.
3. Immediately thrust your upper body forward into the prone position and grab the straps towards the nose of the board as the wave makes contact with the board. This will thrust the nose into the wave.
4. Check the conditions ahead and trim the board.
5. Continue paddling out to sea as quickly as possible to limit the wave pushing you backwards.


Punching a wave

This technique is used on an unbroken wave with a steep or vertical face. In comparison to the roll technique, punching a wave allows you to stay on your board and conserve more energy to reach a victim faster. You will need to practise this technique on different waves to develop the knowledge in relation to which waves are best to punch and when you should use the roll over technique.

Follow the steps below to punch an unbroken wave.

1. Adjust your trim on the board as the wave approaches so that the nose is not lifted out of the water.
2. Lift your paddling rate to increase your momentum.
3. Grab the front board straps and drop your head and shoulders flat onto the board as the wave hits your board. This will reduce your area and assist you to move through the water.
4. Start paddling as your body exits through the back of the wave to stop your board being pulled backwards.
5. Check the conditions ahead and continue paddling.

Catching waves on a board

Catching a wave offers a fast means of returning to shore, but great skill and care are needed to maintain control of the board. When catching a wave, it is important to:

- maintain your forward momentum until you have caught the wave
- regularly adjust your trim to maintain the correct balance once you have caught the wave.

Follow the steps below to catch waves on a board.

Unbroken wave

1. Increase your stroke rate as you paddle ahead of the wave until it picks you up and accelerates you forward.
2. Move your hands back to the line of your hips and hold the side straps of the board as the board slides down the face of the wave.
3. Lift your chest from this position while sliding your weight to the back of the board to prevent nose-diving.
4. Move your arms back to your hip line with elbows projecting away from the board to stabilise yourself if required. Your balance can be further maximised by moving your legs apart in a V-shape.
5. Lean on one of the sides of the board to steer it in that direction. You may also lower one leg into the water to assist a turn.
6. Move your weight forward to trim the board and begin paddling again if you start to 'fall off' the back of a wave.

Broken wave

1. Keep your forward momentum while paddling ahead of the incoming wave to reduce the impact of the wave.
2. Slide as far back as possible towards the rear of the board and grip the side straps just before the wave reaches you.
3. Stabilise yourself by moving your legs apart in a V-shape.

Note:

- If the wave is likely to break on top of you, position yourself on the tail section of the board to angle the nose upwards and grab the side straps.
- If needed, move forward to trim the board when the wave pushes you in front of the white water.
- If you are kneeling, use your hands in the water to stabilise the board.
- Remember to check the conditions ahead.

Paddling with a victim on a board

Refer to *Paddling to shore with a victim* on a board in the *Rescue module* for more information about the skills required and steps to follow when paddling with a victim on a rescue board during rescue operations.