

# Coasts revision notes – aqa geography

[Science](#), [Geography](#)



## **Spring and Neap Tides Spring vs. Neap Tides**

Spring tides occur when the Earth, Sun and the Moon are all about in the same line. This causes the highest tidal range due to the strongest gravitational pulls with the high tides being the largest and the low tides being the smallest.

Neap tides occur when the Earth, Sun and Moon are at 90 degrees which causes the gravitational pull to be less effective. This produces the lowest tidal range of tides.

## **Coastal Transport**

Long shore drift transports material along the coast. In the UK, the prevailing wind blows from the South West causing the waves to approach the southern coast at an angle of 45 degrees. Therefore material moves from the west to the east.

The swash of the wave carries the material up to the beach at this angle. The bed load is moved along by rolling by traction however pebbles are lifted and bounced along the floor in a leap frog action – this is saltation. Lighter material is carried by suspension (such as grains of sand) and weak acids (e. g. carbonic acid from precipitation) may act on soluble rocks (carbonate rocks e. g. limestone) and move the material in solution.

The backwash carries the material at 90 degrees- causing a zig-zag motion. Groynes may be in place to reduce this – however they can be expensive (around £5, 000 per groyne and are unattractively pleasing) yet they do trap the sand.

## **Headland Formation**

Headland formation occurs when the bands rock type run perpendicular to the coast – this is known as a discordant coastline. The coast has alternating bands of resistant (hard) and less resistant (soft) rock – these types of rocks erode at different rates.

The less resistant rock are eroded at a faster rate (through the processes of hydraulic action, abrasion and corrosion) and the more resistant rock erodes at a slower rate and protrudes out into the sea.

## **Wave Refraction**

Now the headland is protruding out into the sea, this receives high energy waves. When the waves hit the coastline, they are refracted and they tend to ‘bend’ round the headland, into lower energy waves. These waves then deposit sediment and beaches eventually build up.

## **Causes of cliff collapse**

### **Coastal Reasons**

When waves head towards the coastline and the sea gets shallower, friction in the bed slows the bottom of the waves and make them more elliptical. The crest of the wave rises and then it collapses.

- Destructive waves are high frequency, and are high and deep. They are around 10-14 waves per minute and their strong backwash removes material.
- The waves break at the base of the cliff where the wave energy is concentrated.

- This part of the cliff experiences rapid erosion thorough – abrasion, where material carried by the waves (eg rocks) are hurled against it. Also, H. A where the pressure of the air in the cracks from the water compress and release which erodes it.
- This forms a wave cut notch
- Over time, under the force of gravity, the mass above the wave cut notch cannot hold and collapses.
- This processes of collapsing continues and the cliff retreats back.
- This then leaves behind a wave cut platform that is no more than 5 degrees at the Low Water Mark.
- As the platform gets longer, the waves have to reach further and many dissipate reducing the rate of erosion.
- Sub Arial processes erode the platform such as paddock and seaweed.

### **Sub-Arial**

- Not directly linked to sea, but from land
- Freeze Thaw – When the diurnal range is around 0 dregrees – Scottish Highlands – Water expands by around 9%. Fluccutations in pressure fragments of rock may break off.
- Biological - Rabbits may burrow into the cliff and piddocks may also weaken the rock which may remove some of the rock.
- Chemical weathering, CO<sub>2</sub> found in rainwater may form carbonic acid when it rains – attacks the calcium carbonate such as in limestone.
- Mass Movement
- Slumping – Rainfall infiltrates the soil, making it heaver.
- The material moves downhill, leaving a exposed scarp face