



## The Compton Cliffs!

### Introducing Compton

Compton Bay lies on the west coast of the Isle of Wight. This stretch of coastline is extremely active. In this study you will learn about:

- ✓ The basic **geology** of the area and how this affects rates of coastal erosion
- ✓ How **aspect** affects rates of erosion here
- ✓ The main characteristics of the **cliffs** at Compton Bay
- ✓ The formation and key characteristics of the **wave-cut-platform** at Hanover Point.

### Geology

Examine the map below, which shows a simplified geology of the Isle of Wight. Apart from the resistant chalk that runs through the middle of the Island and has, due to its relative resistance to erosion, created the *downs*

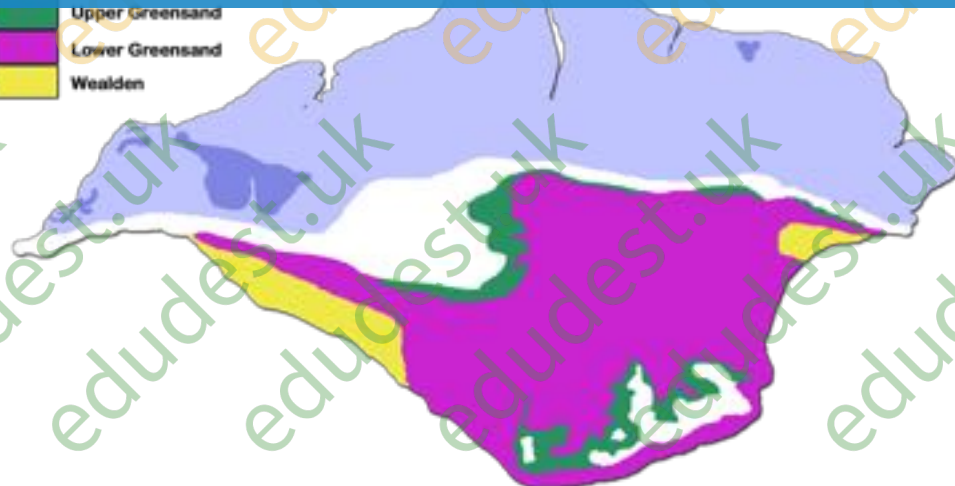
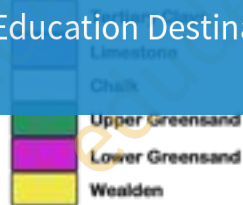
(the 'spine' of the island), the coast of the Isle of Wight consists of relatively 'weak' rock. Greensand and Wealden.

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### Aspect

The aspect of a stretch of coastline (or anything else for that matter!) is the direction in which it faces. The aspect of a hillside can affect the microclimate and therefore the types of vegetation that grow there.

As far as coasts are concerned, aspect can have a dramatic effect on rates of weathering and erosion and, therefore, the characteristics of the coastline.

Due to its location on the west coast of the island, Compton Bay faces towards the prevailing (the most common) south-westerly winds.

There is also a long fetch (the distance of open sea over which the wind travels and generates waves; the longer the fetch, the more energy the waves have!). This makes it popular with surfers, but it also means that this stretch of coast is high-energy and that rates of erosion are rapid.

**Activity: Annotating!**

Based on what you have read on page 1, label and annotate the following image which shows Compton Bay looking west towards the *downs* and Freshwater beyond.

Your **labels** should pick out the main features in the photo; both human and physical (ensure that you label the different geologies that you can see; chalk, greensand and Wealden beds).

Your **annotations** should be detailed explanations of how the geology and aspect affect this coastline.

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### Cliff Characteristics!

So, you know how the geology and aspect of this stretch of coastline have affected erosion, making it one of the most dynamic and 'active' areas of coast on the island and, in fact, the UK.

You are now going to study the cliffs in more detail to look for evidence of the physical processes of weathering and erosion that are taking place here, and also to examine how this is affecting the characteristics of the cliffs.

**Sub-aerial** (on the face and top of the cliff above the water) weathering acts on the cliffs: these are the biological, chemical and mechanical/physical processes that lead to the breakdown of the rock in situ.

**Discuss with a partner, and then with your teacher as a group what these different processes are and give examples of each.**

1. Biological weathering...

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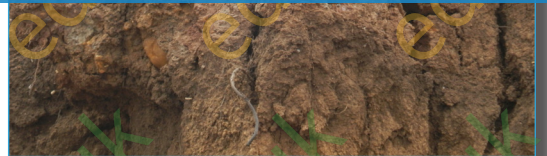
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2. Chemical weathering...

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3. Mechanical/physical weathering...



**Marine processes of erosion** (can you name the four types?) also act at the base of the cliff. Combined, these marine and sub-aerial processes may lead to mass movement. Mass movement is the down-slope movement of weathered material under the force of gravity, and it is more likely to occur on soft-rock coastlines where resistance to erosion is low and exposure is high. The cliffs at Compton are the perfect recipe!

**Rockfalls** occur on steep cliff faces – rock particles and blocks detach along joints and fall to the bottom of the cliff.

**Rotational slides/slumping** occurs in weak geologies where material slides down a distinctive curve-plane. It often follows heavy or persistent rainfall causing waterlogging.

**Mudslides** occur when accumulated debris at the base of a slump absorbs water and slides slowly downslope where it forms a 'lobe' which is gradually washed away by the sea.



### Wave-cut Platforms

Wave-cut-platforms are evidence of cliff retreat. They form when waves attacking the base of the cliff form a **wave-cut-notch**. As the notch gets larger, the cliff is undermined and weakened and the rock above the notch eventually collapses. The process repeats again and again and, over time, a platform of gently sloping rock is left at the base of the cliff, exposed at low tide; this is a **wave-cut-platform**.

A wave-cut-platform can be seen at low

tide at Hanover Point, at the eastern end of Compton Bay (pictured). At extremely low tides, the water is so low

that the decaying wreckage of SS Carbon which ran aground on the ledges here in 1947 can be seen.

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- ▶ Try to include some evidence of processes of mass movement.
- ▶ Draw and label/annotate a sketch of the cliff to summarise what you have learnt.