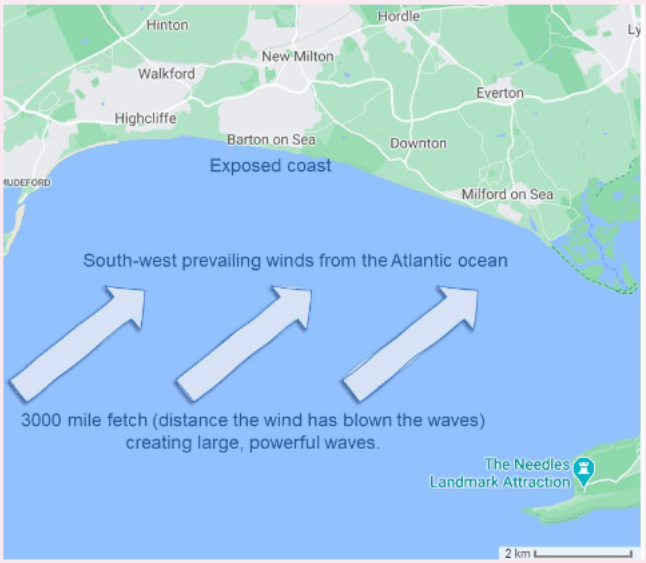
Coastal defences in some areas have failed to work, and have led to **accelerated erosion** in other areas.

Poor planning around Barton-on-Sea has created an issue referred to as **"terminal groyne syndrome"**.

Terminal groyne syndrome is a coastal process where groynes (structures that trap sediment from longshore drift) cause **sediment buildup** on one side of the groyne (in the direction of longshore drift), but **starve an area of sediment** on the other side.

Groynes have been built on the coastline of Christchurch Bay to protect cliffs to the west, but this has **starved the beach of sediment further east** and caused very **rapid erosion**.

The coastline of Christchurch Bay experiences the **full force of waves** brought from the Atlantic. These waves have a **long fetch**, so they are very powerful.



(Source: adapted from Google Maps)

The powerful waves quickly erode the **cliff bases** through hydraulic action and abrasion, which makes them unstable and vulnerable to collapse.

(Source:wessexcoastgeology.soton.ac.uk/barteros.htm)

Decades of erosion has caused the cliff edge to retreat by **tens of metres**, and now many **buildings are very close to the cliffs**. In some cases, residential areas may only be several metres away from the cliff edge.

Extra weight on the cliff tops from buildings combined with existing instability at the **cliff bases** (caused by erosion) can create issues. The cliffs become too unstable and **collapse under their own weight**. Several houses and a cafe have already been lost to cliff collapses.

The cliffs on the coastline surrounding Christchurch Bay are made of **sandstones and clays**. These rock types are easily eroded by the sea and through weathering as they are very soft.

The image below was taken in July 2020, since then the photographer wrote that this landform has already been eroded away.

(Source:wessexcoastgeology.soton.ac.uk/barteros.htm)

Residential and industrial developments have created **impermeable surfaces** further inland (from concrete etc.) and altered the **natural drainage system** of the coastal area. More water is drained directly into the coastal cliffs rather than into soil water and groundwater stores inland.

Barton-on-Sea (Groynes visible on coast).
(Source: www.mitchells.uk.com/about-us)

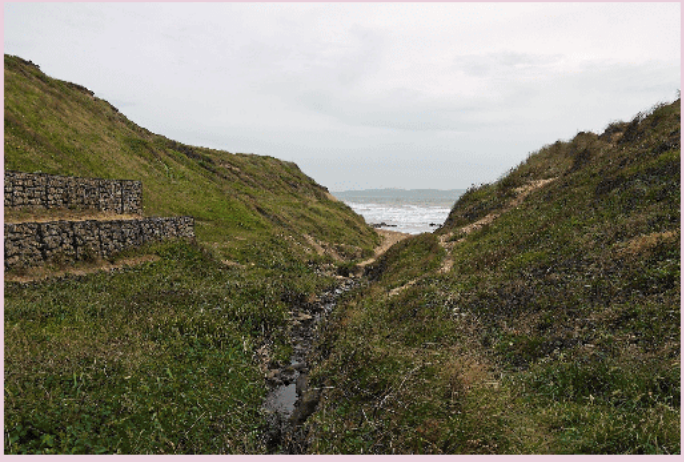
Mass movement (both landslides and slower, more gradual processes) occurs when the cliffs become too wet.

For example, **cliff erosion** at Naish Holiday Park in Barton-on-Sea has increased rapidly as a result of the groynes located further west, seen in the image below.

(Source: adapted from - wessexcoastgeology.soton.ac.uk/barteros.htm)

Several rivers in the area flow to the coast through steep sided coastal gorges known as **chines**.

The rivers usually infiltrate and flow through the **permeable rock** by the time they reach the coast, which adds a lot of water to the cliffs and can cause instability, as well as erosion.



Becton Bunny, a famous chine in the area.
(Source:http://walkinginthecountry.blogspot.com)

As well as being vulnerable to erosion, this rock type is also very **permeable**. **Water infiltrates easily and saturates the cliffs** during wet periods, which adds weight, increases instability and encourages **mass movement** and **collapse.**

(Source:wessexcoastgeology.soton.ac.uk/barteros.htm)