

Southsea's Shingle

Shingle beaches are natural formations found only in a **few places** around the world. The UK is home to around 6,000 of them, most of which are found here in the in the south east of England.

These unique environments have many fascinating qualities which make them special and important places.

Shingle beaches are geologically important

The pebbles on Southsea beach formed millions of years ago in the cretaceous period, when the south of England was covered ago by a warm tropical sea.

Prehistoric sea creatures made their burrows in the ancient seabed which formed the chalk that now underlies much of the south of England. Over millions of years these burrows filled with silica, which eventually lithified to form **flint**.

As global sea levels later rose and fell in response to fluctuations in the volume of ice during the **ice ages**, this flint was eroded out of the **chalk** and reworked by wave action into the beach that now fringes our shore. That makes every pebble on the beach a fossil.

Scopac Solent Animation: <http://www.scopac.org.uk/solent-evolution.html>

Shingle Beaches are Ecologically Important

Shingle beaches create rare and interesting habitats. They have been referred to as Britain's only deserts. This is because the pebbles heat up by day and cool rapidly at night, and because their high permeability means that they are dry places, even when it rains.

These tough conditions mean that only rare and **specialist vegetation** can handle it. As a result, much of the vegetation found on shingle beaches is **internationally rare**.

These environments are also extremely important for **invertebrates**, and are home to many species found nowhere else in the world. They are also vital to populations of rare breeding **birds** many of which travel thousands of miles to feed on our shores.

It is thought that the total extent of coastal vegetated shingle throughout the whole of England is no more than 43 km², and most of this is concentrated here in the south east.

Shingle Beaches Protect

Shingle beaches have several unique characteristics that means they work great as a natural flood defence, creating an armored barrier to land and property built behind them.

Shingle Beaches Dissipate

Shingle beaches are exceptionally good at dissipating wave energy, able to **absorb** up to 90% of the force they are exposed to. This is because shingle is much more permeable than sand allowing much of the water from incoming waves to drain into the beach before it can reach the beach crest and beyond. It also means shingle beaches have a much lower capacity to **saturate** than sand. This reduces the erosive force of the backwash making them a lot more resilient.

Permeability and Swash experiment: <https://www.youtube.com/watch?v=39FfOa1qTX4>

Shingle Beaches Reflect

Shingle beaches can support a much steeper slope than sand beaches. This not only acts to **reflect** incoming waves, but the increased gradient also means that less material can support a **higher crest**, giving better protection from overtopping by high waves and tides.

Angle of repose experiment: <https://www.youtube.com/watch?v=gsP4WK4RGUU>

Shingle Beaches Respond

The unique characteristics of shingle mean that their profile adjusts to changes in wave energy that sand just can't. The **properties** of the shingle mean that whilst the much of the beach flattens (which works to dissipate the waves) the backshore section builds up creating a steeper higher reflective barrier. In the summer months however when the waves are smaller the steep beach will return to its usual profile. These dynamic qualities are carefully **monitored** by our in-house experts.

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