

Location & Access:

The Saunton glacial erratic can be found at Saunton Sands in North Devon.

Saunton Sand beach is located 5 km to the west of the village of Braunton.

The beach can also be accessed via the South West Coast Path.

There is a large car park at the head of the beach (but it is expensive!)



The Saunton Erratic

Key Geography: Saunton Sands beach, marine erosion & deposition, glacial erratic, raised beach, cliffs & caves, wave cut platform, cross-bedding, unconformity, head deposits, sand dune system of Braunton Burrows nearby.

Description: The Saunton erratic is a large, pink porphyritic micro-granite boulder, that originates from Gruinard Bay, Wester Ross, in the north western highlands of Scotland. Its weight has been estimated at between 10 and 12 tons, and it is embedded in the base of the cliff line below the Saunton Sands Hotel. An erratic is a boulder or fragment of rock that has been carried from its original site by ice and deposited somewhere else, where it bears no connection to the local geology. The Saunton erratic sits on a wave cut platform of the Devonian aged Pilton shale beds, and it is sealed in place by the stratified 'sand rock' of Pleistocene raised beach deposits created in the Ipswichian interglacial that now form the current cliffs. The erratic must have arrived in this position after the shore platform of the Pilton Shales was cut, but before the sand rock that was subsequently laid down above it. It is clear – even to the common observer – that this boulder is not part of the local Pilton shales it stands upon.

The Pilton shales beds that form the wave cut platform were created around 365 million years ago in the Devonian period. They were once soft muds and sands, laid horizontally on the sea bed. They have since been compressed and hardened and then severely folded, uplifted and contorted to now stand close to vertical. The sea has since carved this rock into sharp ridges, and ancient fault lines are marked by long, straight and deep gullies, created where less-resistant beds have been eroded at a faster rate. The shore platform has a number of steps or different levels that can be identified, according to past changes in sea levels. If you look closely and hunt around, you might be able to find some crinoids (fossilised sea lilies) in the shale beds. These Devonian beds extend underneath the sand rock cliffs before rising steeply along the line of the coast road at the top. They can be seen in numerous cuttings and quarries along the roadside.

The sand rock that surrounds the erratic are part of a raised beach that demonstrates how sea levels in this location have been at different heights in the past. The old cliff-line – now high above the present *(continued overleaf)*

Curiosity Questions:

Where else in north Devon can you access a large glacial erratic? # What is the name of the blockbuster movie that was filmed on Saunton Sands in 2021? # What song by Robbie Williams was shot as a video on Saunton Sands? # On August 3rd, 1990, the highest temperature ever recorded in the Devon and Cornwall region was recorded at Saunton. What was it? # What shape are crinoid fossils (sometimes found in the Pilton shales)?

Further information:

www.brauntoncountrysidecentre.org

www.coastwisenorthdevon.org.uk

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one at the level of the coast road – was created in interglacial periods when the world was warmer and sea levels higher. Combined with a general eustatic uplift, it is raised some 40 feet or so above the present sea level. During the ice age, sea levels fell. Since the end of the last glacial period, sea levels have started to rise again, and the cliffs are currently retreating quickly.

Ice ages have been one of the main reasons why sea levels have changed in our geological history. During the last 2 million years or so (the Quaternary Period), ice ages have come and gone roughly every 100,000 years. As the ice caps trapped water from the oceans, world sea levels fell between 100 and 200 metres. At the peak of the last ice age (about 18,000 years ago) a Palaeolithic hunter stood on the cliffs at Saunton would not have been able to see the ocean, as it would have retreated beyond the horizon. During the warmer inter-glacial periods, sea levels rose again – perhaps even reaching higher than their position today. Of course, today we also have to consider additional rising sea levels due to anthropogenic causes.

At this location, it is possible to identify a clear unconformity where the heavily folded and faulted Devonian age Pilton shales are overlaid by Quaternary sandstones. An unconformity occurs where two adjacent rocks were not formed one after the other in the Earth's geological history. Here, the Devonian age rocks (named after the county where these rocks are common) were laid down between 416 – 359 million years ago, while the Quaternary deposits were started only about 2.6 million years ago.

There is a lot of debris surrounding the erratic resulting from recent cliff collapse. High tides bring the sea right up to the base of the cliffs at this location, and clear undercutting is evident all around the granite boulder. It is quite possible that if erosion at this site continues, the pink granite boulder may become lost beneath chunks of fallen sand rock.

There are a number of small caves in the Saunton cliffs, the result of differential erosion due to the differing resistance of the cemented beds.

Shingle beds and limestone beds (only 1 to cm wide) can also be identified in places in the sand rock if you look really closely. Also, at the base of the cliffs is an indication of an earlier beach level, now 5 cm above current level. Fossilised acorn barnacles can be found in the sand rock here, and these of course spend their lives below low water.

It is also possible to identify examples of cross-bedding in the sand rock cliffs. Here, the sand has been sorted by flow – with both wind and water helping to create the cross stratification.

The upper cliffs contain a loose matrix of angular rock fragments of varying size. Such deposits are known locally as 'head', a farmer's term for deep rubbly subsoil. This part of the cliff profile was created by the slow down-slope flow of saturated sub-soil – a process known as solifluction. Mass movement like this is particularly active in periglacial environments. In the coldest parts of the last Ice Age that took place some 180,000 years ago, North Devon was a tundra-like wilderness with mean average temperatures about 10 degrees Celsius colder than today. The ground would have been permanently frozen (permafrost), and only the top metre or so briefly melted in the spring to create an unstable slurry that flowed easily on the permanently frozen ground below. Frost shattering in the cold spells detached fresh rock fragments to feed the flow.

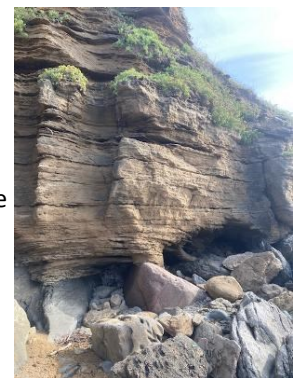
So, how did the erratic get to Saunton? It was certainly transported by ice, but there is some debate about what form the ice took. One theory suggests that the boulder was carried here by the ice sheets from the Anglian Glaciation, the last to affect this area. Alternatively, the boulder could have been a dropstone carried to its present location by a grand iceberg.

The Saunton erratic is easily accessible, although it does involve a bit of clambering over the steep ridges of the wave cut platform at the north end of the beach. It can be found embedded in the base of the cliffs around 200 metres to the west (towards the sea) of the white buildings of the Saunton Sands Hotel that stands on the top of the cliffs.

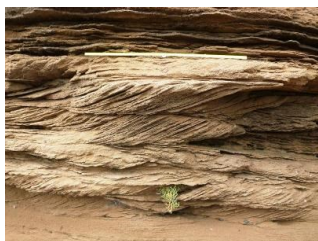
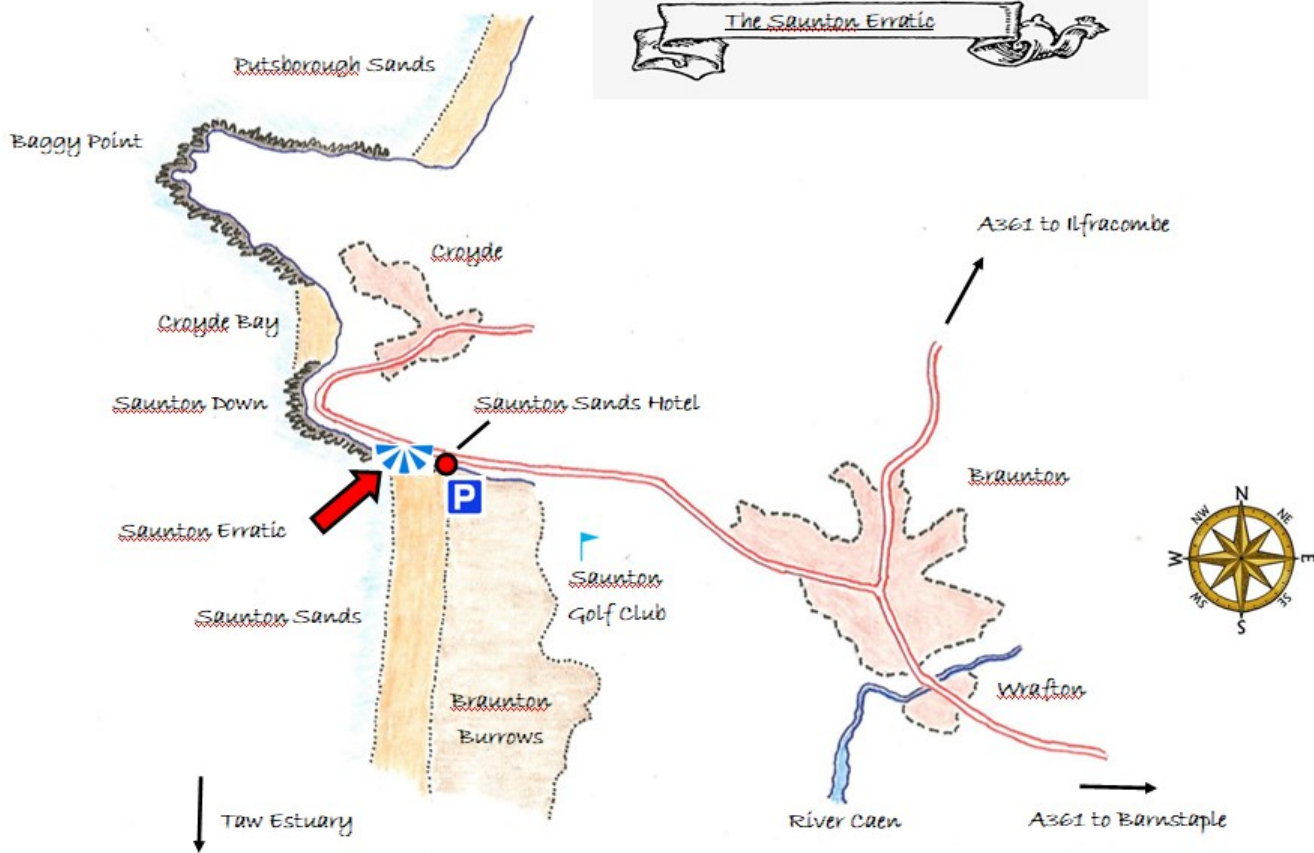
The erratic can be found at grid reference: SS 44028 37875. Alternatively, you could use the What3Words location code of: [///revised.nylon.flying](https://www.what3words.com/?q=///revised.nylon.flying)

Bear in mind that the erratic is not accessible at high tides, so make sure you check local tide tables and visit the site at low tide so you have plenty of time to explore.

The Saunton example is one of a suite of over twenty glacial erratics that can be found along this stretch of north Devon coastline. A number of these are located on the foreshore at Saunton, but they are quite difficult to find, as the sea has disguised their form, and in some places they have been covered up with eroded debris.



Saunton granite erratic



Cross-bedding



Raised beach sand rock



Granite erratic



Wave cut platform

Answers to Curiosity Questions:

- # Where else in north Devon can you access a large glacial erratic? (At Freshwater Gut, on Bagg Point in Croyde Bay)
- # What is the name of the new blockbuster movie that was filmed on Saunton Sands in 2021? ('Aquaman 2' starring Jason Momoa)
- # What song by Robbie Williams was shot as a video on Saunton Sands? ('Angels')
- # On August 3rd, 1990, the highest temperature ever recorded in the Devon and Cornwall region was recorded at Saunton. What was it? (35.4 degrees C or 95.7 degrees F)
- # What shape are crinoid fossils (sometimes found in the Pilton shales)? (Star-shaped, and in short columns)