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# Geotrail along the South Stack coastline

[Fully illustrated PDF](#)

[Welsh version](#)

**Enjoy the magnificent Holy Island coastline whilst learning all about its fascinating geology on this beautiful and spectacular walk.**

By Dr J Conway of Anglesey Geopark and Royal Agricultural College

The area around South Stack is a fascinating and beautiful stretch of coastline with not only amazing geology, but many examples of how it influences the landscape and land use. Not only does this Walk follow the coastal footpath within the AONB, but it also goes along a stretch of Heritage Coast that features in the Cybi Circular Walk (great care should be taken along the coastal path which sometimes lies above sheer cliffs and can suffer from strong winds).

The rocks here are some of the oldest in Wales, dating from the Cambrian to Precambrian Period some 500 to 550 million years ago. You will see three main rock types, quartzite, a hard white metamorphic rock formerly a thick deposit of sand; green schist, a banded and intensely folded metamorphic rock, formerly muds and silts on the sea bed; and dolerite, an igneous rock, squeezed into complex cracks within the schists, as a molten liquid, which now appears as a brownish weathering vertical dyke of rock along the cliff.

This trail starts from the junction of South Stack Road, and the land to the lighthouse grid ref [SH 217 814]. A small footpath leads down to the coast, but is a dead end. Nevertheless it is worth the walk to get close to the sea [stop 1][SH 21496 81576] and appreciate the scale of these cliffs in the South Stack series meta-sediments. Return to the road and carry on to the RSPB car park. Opposite is the footpath to the Ty Mawr Hut Circles [stop 2][SH 21120 81964], a settlement of some 8 farmsteads dating from around 4000 years ago spread over 8 hectares of the mountainside, consisting of round houses with stores and workshops adjoining, associated with a system of ploughed archeological fields. Finds point to the processing of grain, and harvesting of shellfish and most interestingly the use of local geology in the form of so-called "pot boilers". The houses themselves are built of the local quartzite, but the original Neolithic occupants went to great efforts to collect dolerite pebbles (from an igneous dyke), probably from Porth Namarch on the other side of Holyhead Mountain to heat in the fire and transfer heat either to a cooking pit, or to boil water. Experiments with the local rock revealed that it explodes like a hand grenade when heated and placed into water.

Now take the path through the RSPB carpark down to the coast and turn left again this is a dead end but the view along the coast towards the lighthouse is spectacular [stop 3][SH 20890 81765], and enables a clear view of the massive dyke that exits the cliff below you, trends along the foot of the shear cliff, then diverts to the left of the island under the lighthouse. The cliffs here are in the South Stack Formation, consisting of greenish schist and browner sandstone rocks. Faults and major joints create massive blocks and control the erosion of the cliffs.

Turn up the road towards the public toilets, sited in a small disused quarry [stop 4] where there is a clear exposure of a soil profile known as a podsol. This has a thin peaty surface accumulation of dead organic matter, over a pale greyish layer from which the iron has been leached [washed] out by organic acids, and re-deposited lower down as a thin rusty coloured layer [an iron pan]. Below the soil is the rock, frost shattered during the latter stages of the ice age. This soil underlies much of the South Stack Moor area, and being very acid and infertile has been ignored by farmers. It now constitutes one of the largest areas of maritime heathland in North Wales and presents a superb display of golden gorse and pink/purple heathers in spring and early summer.

Carry on up the road to the café and information point where you must purchase tickets (Easter to Sept.) if you intend to descend the steps and cross onto the small island bearing the lighthouse from where there is a spectacular view of folding in the cliffs.

The folding is not easily seen from here, so descend the stone steps and continue to Ellin's Tower [stop 5][SH 20636 81991], noting how Carboniferous Limestone has been brought from the other side of the island to make walls and steps. Various brachiopods and corals can be seen in this building stone.

From here there is a good view of the sheer cliffs in the South Stack Formation, with folding and faulting controlling the appearance of the cliffs and presenting the birds with innumerable ledges for nesting.

Continue along the coastal path, climb the steps up to the road and walk along to the entrance to the lighthouse [stop 6][SH 20456 82275]. Note, you will need a ticket to cross the bridge to the island. Start the descent of some 200 steps [about 50m] taking your time to examine the rocks as you pass down the geological sequence, passing some brownish turbidites (rocks containing a mixture of fragments deposited by fast flowing water on the sea bed) with poorly exposed graded bedding.

While descending the steps, pause and look back along the coast to view some large scale folding. In spring, the cliffs are covered by nesting seabirds. Cross the bridge onto the island [stop 7][SH 20267 82294] and look back at the multiple folding within these rocks. There is a series of display boards inside the lighthouse buildings detailing the Geopark and RIGS activities in the area. Tours of the lighthouse are sometimes available

Climb the steps back to the road, and then continue along one of the many paths leading towards Holyhead Mountain. The soils here are either podsoles like the one in the small quarry, or more usually just a thin peaty layer over the rock. Most paths coalesce into a single path that skirts around the lower flanks of the mountain. You are now on the Holyhead quartzite [stop 8][SH 21143 82620], a massive white quartzose sand deposit with some relict sedimentary features but now fused by metamorphism into a crystalline rock.

A path branches off to the right climbing to the summit [SH 21829 82941] which at 220m is the highest point on the island; if you have the energy it is well worth following as it crosses the rampart of an ancient hill fort. On the summit are the foundations of a square building, a Roman lighthouse; though some believe it was some form of temple. The main path skirts the North Stack lighthouse buildings before descending into Breakwater Quarry where there is another [Geotrail](#) to follow.

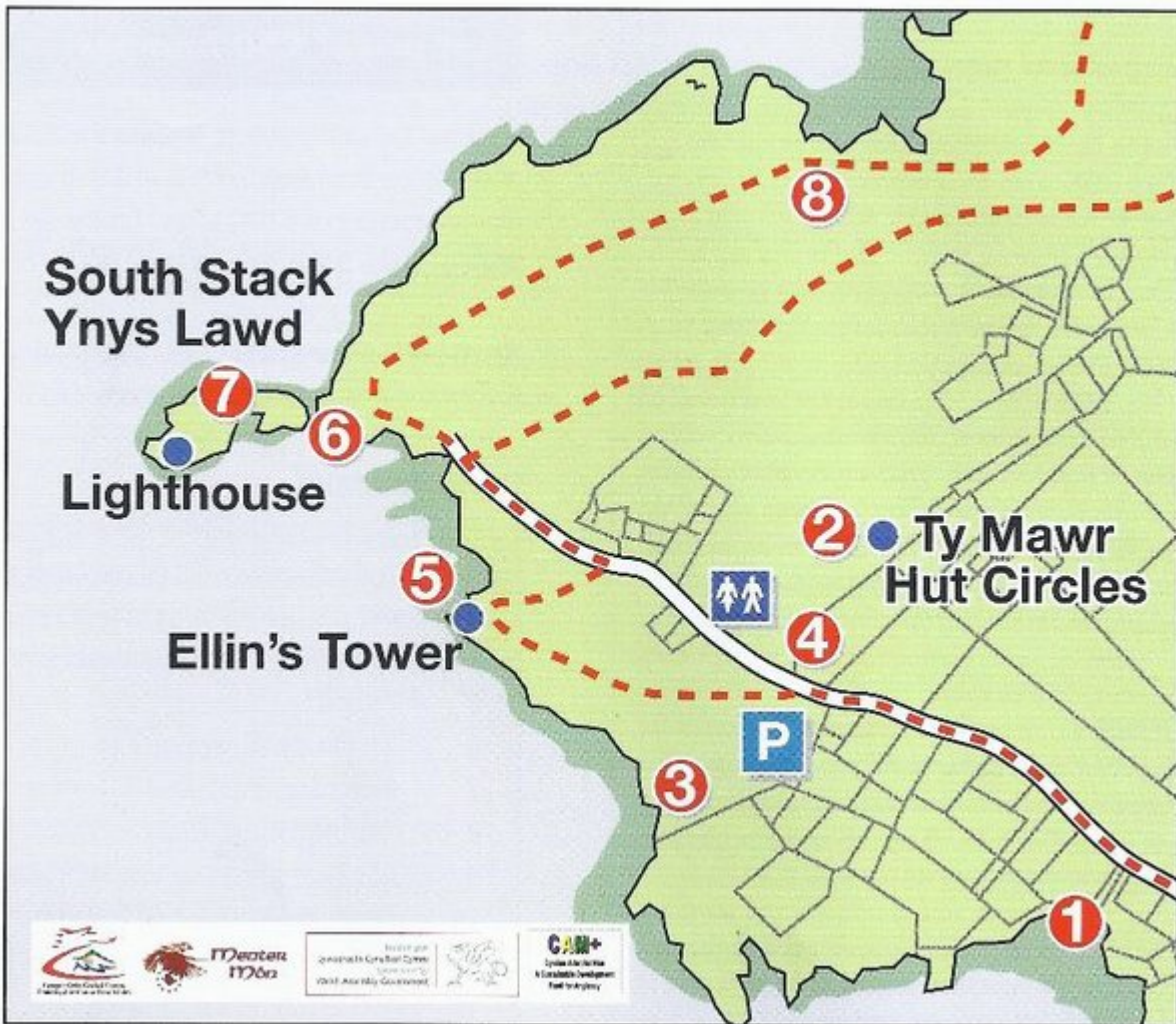
## Figures

[See PDF](#)

Route map. Geotrail along the South Stack coastline.

Looking down to South Stack lighthouse.

[Other uncaptioned photos are in the PDF](#)



Route map. Geotrail along the South Stack coastline.



Looking down to South Stack lighthouse.