

# Berwickshire Coastal Geology Project

[www.berwickshirerocks.org.uk](http://www.berwickshirerocks.org.uk)

## EYEMOUTH'S VOLCANIC ROCKS

*This walk starts on the beach at Eyemouth and takes you around the headland to the west of Eyemouth Bay on the coastal footpath. The circuit is about a mile but there are plenty of rocks to see on Eyemouth beach without walking around the headland. Parking in Eyemouth is available at several free car parks.*

*There are frequent buses from Berwick-upon-Tweed to Eyemouth (235/253).*

**TAKE CARE ON THE CLIFF PATH WHICH IS SLIPPERY AFTER RAIN.**

*Start your walk at the ramp down to the beach next to Eyemouth Leisure Centre and Swimming Pool which is at the west end of the promenade (NT 943 645).*

The cliff in front of you has three rock types of different colours. Nearest to you are orangey-red beds, which have layers of different sized pebbles in them. The sands and pebbles were deposited by meltwater and ice at least 12,000 years ago and they are the youngest rocks on the cliff. The Eyemouth Fort headland is made of sedimentary rocks called Old Red Sandstones, which have roughly horizontal layers, and are about 360 million years old (Devonian).



The mauve/violet rocks are dacites, volcanic rocks which are part of the Eyemouth Volcanic Formation and were erupted about 400 million years ago near the beginning of the Devonian period and are therefore the oldest rocks you will see on this walk.

*At the foot of the ramp look at the smoothed, rounded rocks which are exposed on the beach to your right. They may be covered by sand! These reddish-grey rocks are made of fragments of andesite lava, which were carried along in a lava flow. When the lava cooled and crystallised the resulting rock included the chilled fragments. Later in the walk you will see the volcanic neck from which the lavas were erupted.*



*Walk along the beach and look at the mauve/violet rocks. They are dacite lavas, similar to andesite except that the minerals contain more silica. You can see that some of them are made of fragments of lava but some are layered and contain tiny white crystals, which grew in the magma before the volcano erupted.*



## MELT-WATER DEPOSITS AND GLACIAL TILL

Walk further along the beach until you find the orangey-red beds which lie above the dacite lavas. The photo to the right shows that the sands and pebbles lie in a small valley eroded into the lavas by a river which pre-dates the last ice advance. The deposits at the base of the valley are layered, so they were probably carried by meltwater, whereas the randomly arranged pebbles and boulders embedded in clays above the meltwater deposits are glacial tills, which were deposited when an ice-sheet, which covered this district at a later time, melted about 12,000 years ago.



Retrace your path to the steps and climb to the top of the cliff. You can follow several routes around the headland but take care. As you walk into the first bay you can see more clearly the Old Red Sandstone with its horizontal beds. If the tide is low you will be able to see that the sandstones sit on top of volcanic rocks, which are purple in colour and have uneven joints, by comparison with the horizontal bedding planes of the sandstones.



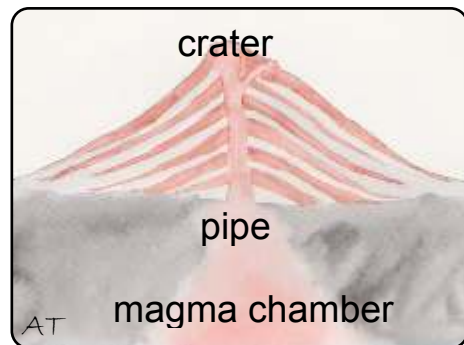
As you follow the coastal path round several inlets, you can see that the Old Red Sandstone cliffs are replaced by an unevenly jointed volcanic rock.

These cliffs are made of andesite and dacite, which formed thick lavas flows which solidified quickly so that each sticky pulse of lava collapsed over the previous flow, giving 'cushion-like' structures. There are wooden steps going down into an inlet, so that you can have a close look at the rocks.



## KILLIEDRAUGHT BAY - A VOLCANIC NECK

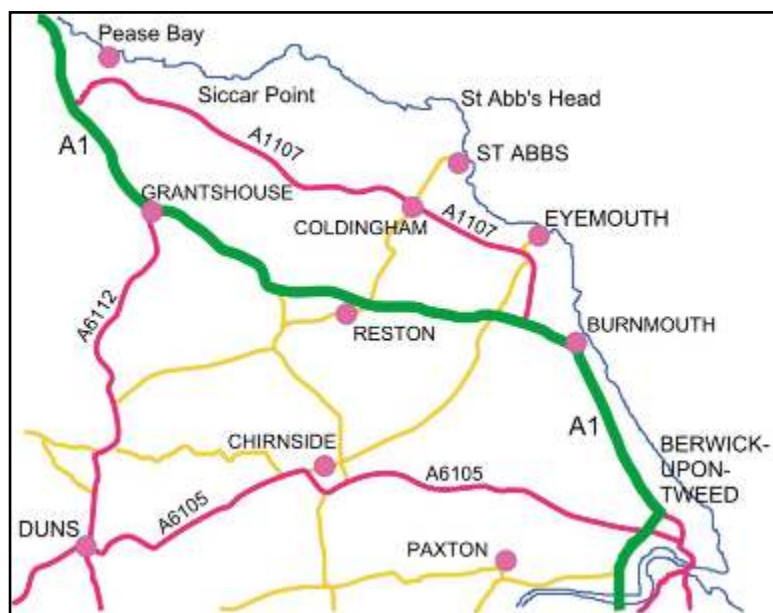
Follow the path until you can see Killiedraught Bay, the site of the volcanic neck. The sketch of the volcano shows how magma reaches the crater through a pipe or neck.



Since the Eyemouth volcano erupted 400 million years, the volcanic cone has been eroded away, leaving only the rocks of the pipe visible in Killiedraught Bay. The rocks of the pipe are called volcanic agglomerates and are made of a chaotic mixture of local rocks and lavas.



To return to Eyemouth, turn left at the end of the coastal footpath and follow the track and road down to the main road, then turn left to reach the sea front.



### USEFUL REFERENCE BOOKS

- Berwickshire Coast Rocks!* 2018 Helen Page
- Scottish Borders Geology - An excursion guide* 1993 A.D.McAdam, E.N.K.Clarkson & P.Stone
- Death of an Ocean - A Geological Borders Ballad* 2010 E.N.K.Clarkson & B.Upton
- Northumbrian Rocks and Landscapes - A Field Guide* 1995 (ed. C. Scrutton) Yorkshire Geological Society

### USEFUL MAPS

- OS 1:50,000 Landranger 67 Duns, Dunbar & Eyemouth
- OS 1:25,000 Explorer 346 Berwick-upon-Tweed
- British Geological Survey 1:50,000 Scotland Sheet 34 Eyemouth (Solid)

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