Walney and its variety of pebbles

Walney Island owes its existence to the **Ice Age**. Deposits of clay and pebbles were left by ice which moved south through the area where the Irish Sea is now. Pinkish pebbles of **Eskdale Granite**, composed of interlocking crystals which glint in the sunlight, show that some of the ice moved down the coast from the northern Lake District nearly 30km to the north. Today the waves continue to wash sand and gravel from the cliffs on to the **beach**. You will see ridges of different sizes and shapes of pebbles. A ridge of pebbles called a **storm beach** builds up at the high tide mark. Spring tides push these ridges higher up the beach. Storm waves can throw pebbles well inland, above the high water mark.

Walney beach. Walney beach changes with every tide. There is always something new to discover.

Large beach pebbles. These pebbles have been washed out of glacial deposits carried from the north by ice sheets and thrown up the beach at spring tides.

Smaller beach pebbles. Waves sort the pebbles according to size. Smaller pebbles may accumulate on the beach during neap tides.

Flat pebbles. These may be derived from rocks that are over 400M years old from the Southern Lake District. The swash of the breaking waves at high tide have thrown these pebbles to the top of the beach

Cumbria GeoConservation is a voluntary group working to record and protect important Local Geological Sites (LGS), formerly Regionally Important Geological and Geomorphological Sites (RIGS). It is a specialist group of **Cumbria Wildlife Trust**. There are 280 LGS in the whole of Cumbria. **The Walney cliffs** are **LGS 6 / 009**. Other LGS in the Barrow area include *Sandscale Haws*, *Hawcoat quarry* and *Dunnerholme Point.*

Walney beach, former sea defences, now below high tide mark, a sand bar and shingle deposits.

Walney is a very special place. **The Geological Conservation Review** (1990) considers Walney to be a unique feature of the English coast , describing it as a barrier island, with recurved spits at either end, a type of large offshore bar, exceptional in being the result of erosion and reworking of glacial sediments, in an environment with a large tidal range .

Walney West Shore Walk

A low tide walk along the beach from Thorney Nook to Hare Hill. *Be sure to check the tide tables before you go.

Walney Cliffs

Walk details

Start from: either Thorney Nook SD 184664
or Hare Hill SD 204628

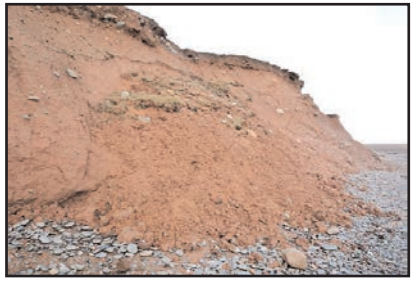
Map: Ordnance Survey OL6 **Time:** 2 hours

Surface: This walk is along the beach on sand and shingle

Route text and photos: Sylvia Woodhead
Design*:* John Shippen 2018

At **Thorney Nook** car park, look along the coast. Walney is composed of low hills of glacial material, deposited and shaped by **glaciers** in the Ice Age. These are called **drumlins**. If you had stood here around 30,000 years ago, at the height of the Ice Age, besides being very cold, there would have been land stretching all the way to the Isle of Man. So much water was frozen into ice sheets in the last Ice Age, that the sea level was 120 metres lower than at present.

As the ice melted the sea level rose, and waves washed away the glacial material on the floor of the Irish Sea. This process is still continuing on Walney as material from the cliff is washed away in every storm, exposing new sections through the glacial deposits. In some places the erosion is up to 3 metres per year, and Walney Island is getting narrower. The line of boulders marks an earlier position of the cliffs As high tides reach the base of the cliffs,

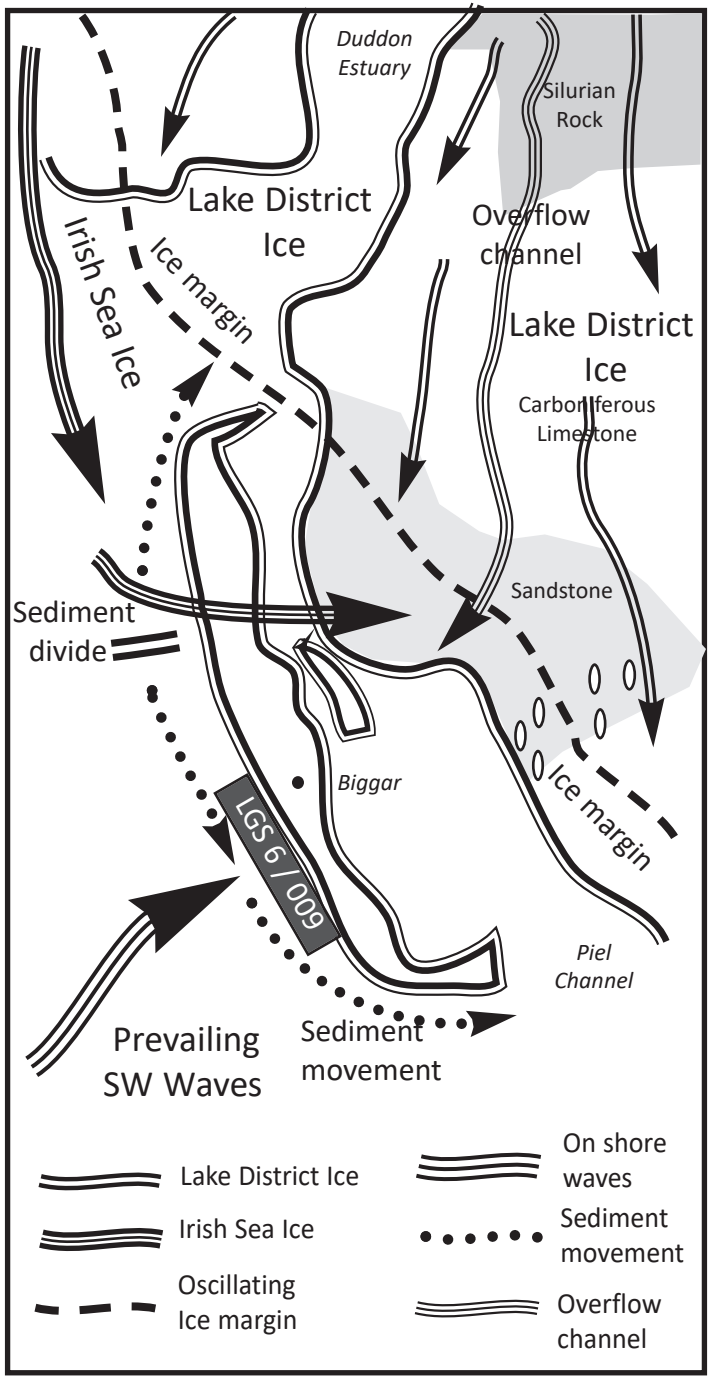


they are undermined, collapse and get washed away at the next high tide. The cliffs collapse in several ways.

These can be seen well along the coast. You can see sharp breaks, or **landslip** scars. Sometimes the cliff slumps away as a mud-slide.

Cliffs af glacial drift on Walney West shore

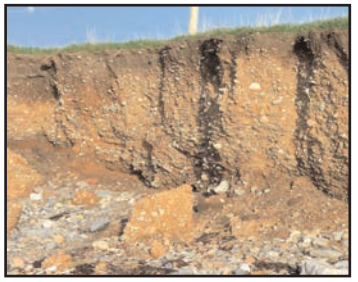
Walney in the Ice Age



Examine the cliffs as you walk south along the beach. Deposits left by the ice are composed of unsorted material, generally set in a matrix of clay, hence the old name of boulder clay for these cliffs of **glacial drift**. The pebbles are likely to be different sizes and shapes. Look closely. Some of the pebbles may seem to be lying in the same direction, pointing to the direction that the ice moved. Many of these pebbles are termed **erratics** , that is they have been brought from elsewhere by the ice. Some boulders may have scratches or striations made by rocks embedded in the ice as it overran them.

Glacial erratic of Borrowdale Volcanic rock, with striations

In other parts of the cliff you will see great spreads of gravel, layers of rounded pebbles, laid down by **meltwater streams** flowing from melting ice sheets at the end of the Ice Age. These can be interspersed with layers of sand, showing that the environment changed in the past. Pebbles are moved only by very fast flowing water, whereas sand can be carried more gently flowing water.



The dominant waves, those with most energy to erode the coastline, come from the south west, hitting the coast at an angle. A process called **longshore drift** moves beach sediment along the coast of Walney, moving it to the two ends of Walney where there are recurved sand and shingle spits. There is a lot to see and ponder; the challenge is to interpret what we are seeing.