

THE SLAPTON LINE – LIVING WITH COASTAL CHANGE

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A short article on storm damage to the Slapton Line and the threats and impacts on the local community.

THE DEVELOPMENT OF THE LEY

An aerial view of Slapton Ley (Fig.1) gives some clues to its origin: it looks as though it has been ‘dammed’ by the beach and the inland shore looks very much like a coastline. The other striking thing, is the relatively fragile nature of the thin strip of beach sandwiched between ‘Ley and sea’: possibly not the best place to build a road. To understand how we got here, we need to understand the history. First point on the journey is around 130,000 years ago. A graph of Antarctic ice core data (Fig. 2) which reveals how our climate has changed, shows a higher temperature and, with less ice at the poles, higher sea levels. Wave-cut platforms similar to those at Hallsands would have been formed, and the sea lapped on that inner western shore of what became the Ley.



FIGURE 1. Aerial view of Slapton Ley

Moving on to the last ice age around 20,000 years ago (see B, Fig. 2). The formation of ice and colder temperatures meant that sea levels fell by around 40 metres and the coastline retreated to 20 miles from the current shore. As temperatures and sea levels started to rise again, the sea washed in a bank of shingle composed of flint and chert which have been matched with offshore deposits. The line of shingle reached Start Bay around 3,000 years ago, began to consolidate and ultimately blocked off various streams, forming freshwater lakes at Hallsands, Beesands, Slapton Sands and the marshes at Blackpool Sands.

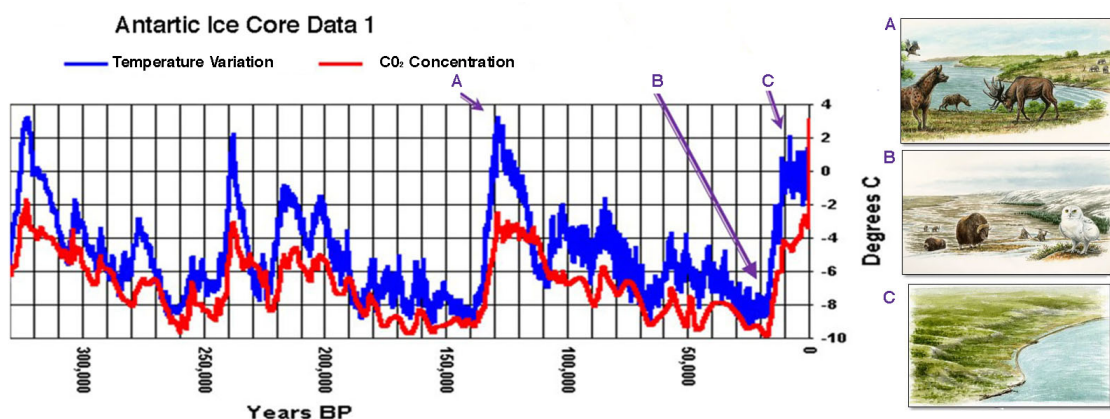


FIGURE 2. CO₂ concentration from Antarctic Ice Core Data, with corresponding temperature °C.

STORMS AND COASTAL CHANGE

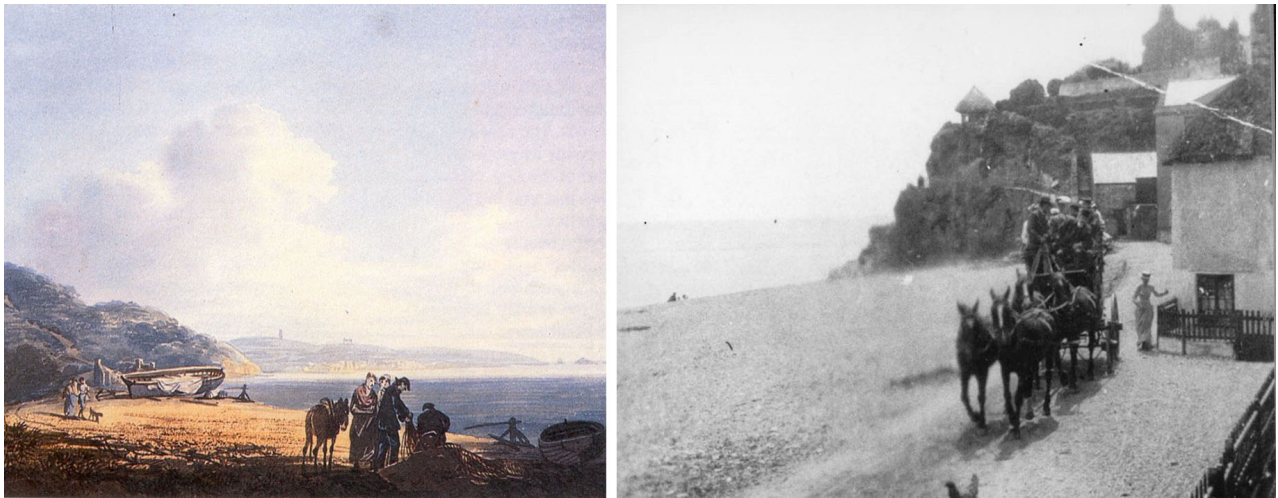


FIGURE 3. The lost village of Strete Undercliff (left); a stage coach service ran along the Ley in the 1870s (right).

Another feature of the area has been coastal change caused by storms. In contrast to the constant erosion seen on the east coast, the southwest is eroded by storms which cut back several metres each time. Maritime maps show a lost village (Fig. 3) at the north end of Slapton Sands, Strete Undercliff. There are a number of references to the village between 1690 and 1703 – the year of The Great Storm that washed away the first Eddystone Lighthouse and its designer Winstanley (Goodall, 2007). Another storm in 1824 is reported to have wrecked hundreds of ships, and an old National Rivers Authority leaflet reports that ‘Slapton Line was breached’. The road was built in the 1860s and a stage coach service was established in 1873 (Fig. 3).

Severe storms continued every ten or 20 years and, after a severe one in 1979 where waves demolished building frontages, the sea wall at Torcross (Fig. 4) was built in 1980. It is now being augmented with double the depth of sheet piling (12 m) in front of the existing wall.



FIGURE 4. The sea wall at Torcross was built in 1979 after severe storms damaged houses. It is now being reinforced with double the depth of sheet piling in front of the existing wall (right).

In 2001, a one-in-25 year event, with winds coming at right angles from the east onto the beach, undermined around 200 metres of road (Fig. 4). A single track road restored vehicle access, but it was 12 months before the new section was opened (Fig. 5). At this time the Slapton Line Partnership was formed, bringing together the ‘stakeholders’ with a responsibility for the road and the land, as well as the public, represented by the councillors. The Partnership helps to speed up agreement over what course of action to take in response to events, and plans future measures.



FIGURE 5. In 2001, storms undermined around 200 metres of the road along the Ley (left); it was 12 months before a new section was opened (right).

The Partnership commissioned a report (Wilson, 2006) to examine the background to the 2001 event and to determine the strategy from here. The study concluded that at that time there was no national funding available and of the options considered, the best one taking into account costs and the environmental issues, was managed realignment – retreating the road inland – which should give the road around 30 years more life. None of the solutions would preserve the road for ever; as we have seen from the experience at Torcross, even substantial and costly sea defences are not infallible.

In February 2014 a series of south-westerlies linked to storm Petra caused flood damage to houses at Torcross, and deposited a large amount of shingle on the road. These storms breached the railway line at Dawlish costing £35m to repair. The road got off relatively lightly, but it stripped the protective layer of shingle away from the toe of the sea wall, from much of the beach, and cut back the central car park by several metres.

The Slapton Line largely experiences waves from two main directions. South-westerlies, move shingle from the southern end up to the northern end depending on the angle of attack and the wave height. Gentle easterlies can bring the shingle back, but above a certain strength will slam into the beach at right angles which was what caused the damage in 2001.



FIGURE 6. Comparison of beach levels at Torcross in 1939 (left) with present day).

During the summer of 2014 the shingle failed to return and, concerned that the toe of the sea wall was exposed and getting a hammering from the waves, the Environment Agency, working with the Partnership, funded moving shingle back from Strete Gate. Twenty-five thousand tonnes were moved costing about £250,000 in February 2015. This improved beach levels at Torcross for the rest of the year before storms again washed the shingle north. In early 2016, scouring at the end of the main sea wall during storms undermined and toppled a century-old section of concrete sea wall just north of Torcross. It was quickly repaired with sheet piling costing £180k and funded by South Hams, Devon County Council and the Environment Agency.

With a changing funding climate, improved understanding of the beach dynamics and a need to review some of the detailed measures that could be taken to better protect the beach, a detailed plan (Beach Management Plan) seems a useful way to review and plan for the next few years of life for the road. We will start this in the New Year and will contact local residents for their views.

REFERENCES

Goodall, F. (2007). *Lost Devon*. Birlinn Publishing

Wilson, S. (2006). *Slapton Coastal Zone Management Main Study. Volume 4: Executive Summary*. Slapton Line Partnership. Available for download at: WWW.SLAPTONLINE.ORG/DOWNLOAD.PHP?ID=84&TYPE=DOWNLOAD_FILE

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