Rock-a-Nore to Cliff End: The Story of Hastings' Vanishing Cliffs

A Hastings Kelp Project community report · Oct 21, 2026 · @Chris

About this report

This report tells the story of the cliffs between Rock-a-Nore in Hastings Old Town and Cliff End at Pett Level: how they formed, what people built on them, how much has been lost, and what may happen next. It is written for anyone who walks this coast, not just scientists.

It was put together by the Hastings Kelp Project (HKP), a community kelp-restoration project based in Hastings. Our interest is simple: the cliffs, the beach and the seabed are one system. What falls from the cliffs ends up in the water where kelp once grew.

The report does not try to answer every question. It sets out what is known, adds some new measurements of our own, and ends with a list of open questions for anyone who wants to dig deeper. If you take one up, please share what you find on the HKP forum.

How to read it: each chapter starts with its main point in one sentence. Words in **bold** are explained where they first appear. Sources are linked in the text and listed at the end.

The short version

If you read nothing else, read this page.

How much has gone?

We compared old maps from 1878 with a modern survey. Here is how far the cliff top has moved back in about 140 years.

Place	Cliff lost since 1878	That's about the length of...
Rock-a-Nore (Old Town)	less than 10 m	a double-decker bus
Ecclesbourne Glen	about 34 m	three buses
Fairlight Glen (Lovers' Seat)	about 42 m	a short street of houses
Fairlight Cove	up to 100 m	a football pitch

At Fairlight Cove the cliff has been moving back by about half a metre every year. That's roughly one long stride a year, every year, for well over a century.

Places that are no longer there

- **A clifftop tea room** stood at Ecclesbourne Glen. People were still buying tea and ice cream there in the 1950s. Landslips in January 1961 left it hanging over the edge, and it was moved onto the beach in 1962.
- **A coastguard station** stood beside it, built around 1861–64 to catch smugglers. In 1962 and 1963 it was pushed over the cliff onto the beach.
- **Lovers' Seat**, a famous bench high on the cliff above Fairlight Glen, fell in a landslip in 1961. Its replacement went the same way in 1979.
- **Homes at Fairlight Cove.** Six houses on Sea Road were lost in the late 1980s and early 1990s, and a bungalow on Rockmead Road fell in 1999.
- **A whole cliff path.** People who walked from East Hill to Fairlight as children say the route they used has fallen into the sea.

Did you know?

- The rocks in the cliffs are about **140 million years old**. Dinosaurs walked here, and you can still find their footprints on fallen blocks.
- At low tide at Pett Level you can see the stumps of a **forest thousands of years old**, drowned as the sea rose.
- Only Fairlight Cove is protected, by three walls of huge rocks built in 1990, 2007-08 and 2016. The rest of the cliffs are left to nature.
- One study estimates around **43 homes** between Fairlight Cove and Cliff End could be lost by 2100.
- Kelp, the seaweed our project is bringing back, **cannot stop the cliffs falling**. But it may calm the smaller waves a little, and it gives a home to fish, crabs and lobsters.

The rest of this report explains each of these in more detail.

1. The coast today

The 7 km of coast from Rock-a-Nore to Cliff End is one of the most spectacular cliff coastlines in south-east England, and one of the most unstable. The cliffs reach up to 150 m high and are cut by steep wooded glens (BGS memoir). Much of it lies in Hastings Country Park, and the whole stretch is a Site of Special Scientific Interest for its rocks and wildlife (BGS).



Figure 1.1. The cliffs at Rock-a-Nore, looking east, October 2026. The tall pale face is Ashdown sandstone, cut by vertical cracks (joints); fallen blocks lie at its foot. The headland beyond leads to Ecclesbourne Glen. Photo: Hastings Kelp Project.

It helps to think of the coast in five sections, each with its own character:

Section	What you see	What happens to it
1. Rock-a-Nore and East Hill	Tall faces of golden sandstone above the fishing beach	Occasional big rockfalls; very slow retreat overall
2. Ecclesbourne Glen to Covehurst Bay	Sandstone cliffs, wooded glens, a large landslip at Covehurst Wood	Landslips and falls; slow to moderate retreat
3. Fairlight Glen to Lee Ness	High cliffs of softer mudstone, landslides below Lovers' Seat	Moderate retreat, mostly through landslides
4. Fairlight Cove to Haddock's	Lower cliffs with houses close to the edge; rock defences on the beach	The fastest retreat on this coast
5. Cliff End	A short sandstone cliff where the Pett Level sea wall begins	Little measurable change

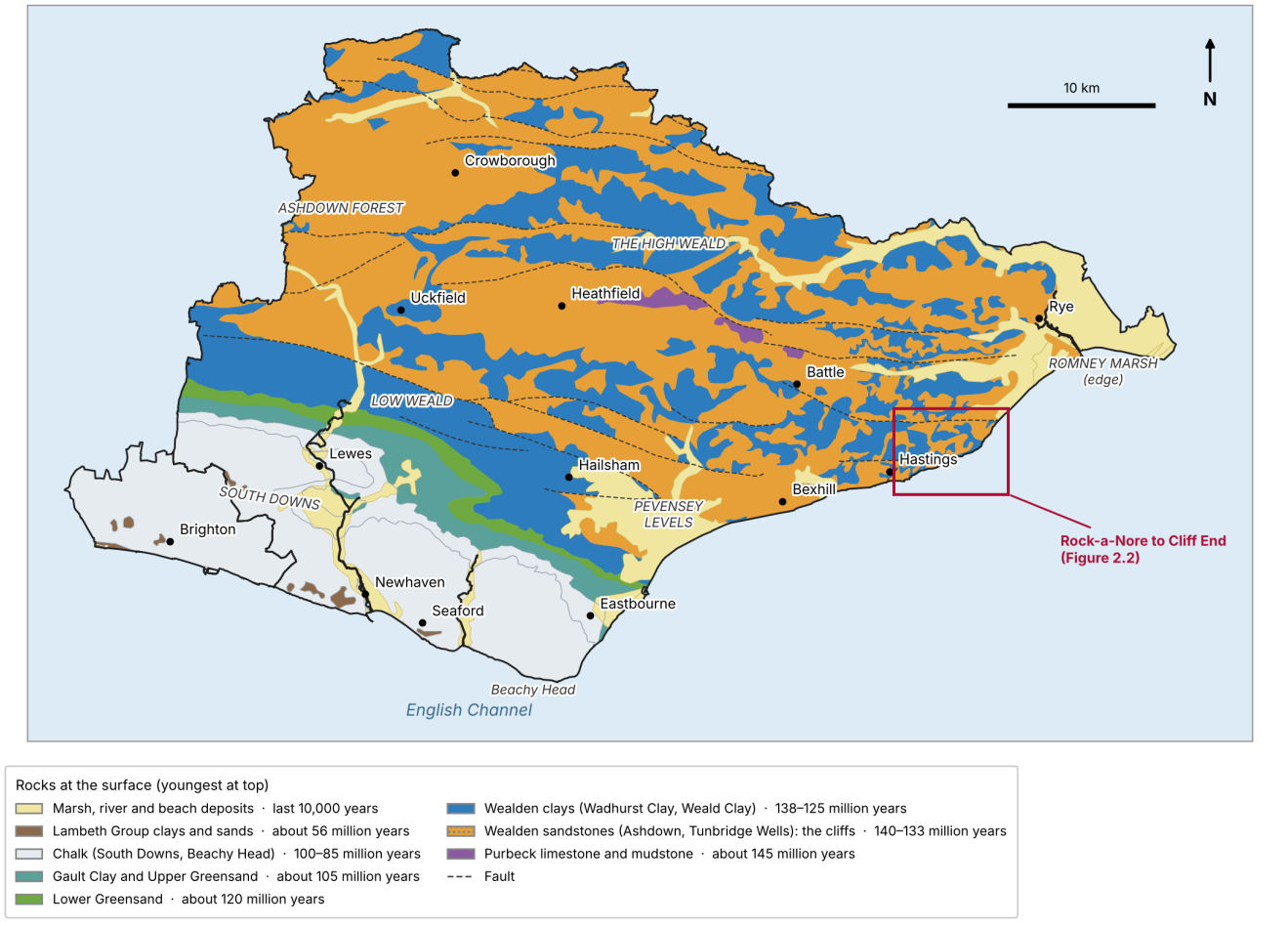
The cliffs are dangerous. Falls happen without warning in every season, including large slips at Rock-a-Nore in July 2013, January 2014 and August 2026 (see Chapter 5). Always keep well away from the foot of the cliffs and check tide times before walking the beach.

2. Deep time: how the cliffs were made

The cliffs between Rock-a-Nore and Cliff End are a slice through a landscape of rivers, swamps and lagoons that existed about 140 million years ago. Dinosaurs walked across it. Since then the rocks have been buried, squeezed, lifted and cracked, and today the sea is slowly taking them apart.

The rocks beneath East Sussex

Old Wealden rocks in the middle, younger chalk to the south, recent mud in the low-lying levels.
The Hastings cliffs are cut into the old Wealden sandstones and clays (orange and blue).



Geology: BGS Geology 625k (DiGMapGB-625) © UKRI, Open Government Licence. Boundary: ONS, Dec 2024, OGL, contains OS data © Crown copyright. Map: Hastings Kelp Project.

Figure 2.1. The rocks beneath East Sussex. The middle of the county (the High and Low Weald) is made of old Wealden sandstones (orange) and clays (blue), laid down by rivers and lakes 140 to 125 million years ago. Younger chalk forms the South Downs and Beachy Head, and recent mud and shingle fill the low-lying Pevensey Levels and the edge of Romney Marsh. The red box marks the cliffs covered in this report. Source: BGS Geology 625k © UKRI; county boundary © ONS, contains OS data © Crown copyright; both Open Government Licence.

When Hastings was a swamp

In the Early Cretaceous period, about 143 to 134 million years ago, this part of the world lay much further south and had a warm, almost subtropical climate (Bath Geological Society). A huge, shallow freshwater lake or lagoon covered what is now the Weald, Hampshire and northern France (BGS memoir, 1987).

Rivers flowed into it from the surrounding hills. Where the rivers ran fast they dropped sand, which became **sandstone**. Where the water was still, fine mud settled, which became **mudstone** (a hardened clay). Plants grew on the mud flats, then the rivers buried them again. Over millions of years this built up hundreds of metres of layers. Geologists call this whole set of rocks the **Hastings Beds**, because Hastings is where they were first described.

The layers you can see today

The cliffs are made of two main formations stacked on top of each other, oldest at the bottom.

Layer (top = youngest)	What it is	Where to see it	How it behaves
Wadhurst Clay	Grey mudstone with some hard sandstone beds, including the Cliff End Sandstone (up to 10 m thick)	Top of the East Hill cliffs; Cliff End	Mudstone crumbles; the sandstone beds stand out as ledges
Upper Ashdown Formation	Thick, pale sandstones and siltstones, including the Top Ashdown Sandstone and the Lee Ness Sandstone	The big sandstone faces at Rock-a-Nore and East Hill; Lee Ness	Strong; forms steep cliffs that fall in blocks
Lower Ashdown Formation ("Fairlight Clay")	Soft, mottled red, green and purple mudstones	Low in the cliffs from Ecclesbourne Glen to Fairlight Cove	Weak; slumps and slides, especially when wet

Together the Ashdown layers are between 115 and 215 metres thick in this district, and the Wadhurst Clay 15 to 60 metres (BGS memoir). Some sandstones are glued together by natural lime and are very hard. Quarrymen called this "Bluestone" or "Hastings granite" (Deposits Magazine).

Dinosaur country

The Hastings area is one of the best places in Britain for dinosaur fossils. The first known *Iguanodon* was found here in 1825 (University of Cambridge).

- **Footprints:** between 2014 and 2018, Cambridge researchers recorded 85 dinosaur footprints along a 6 km stretch of cliff between Hastings and Fairlight Cove. They were made by plant-eaters such as *Iguanodon*, armoured dinosaurs and possibly long-necked sauropods, plus meat-eating theropods (Sci.News).
- **Where to look:** the prints usually survive as sandstone "casts" on the underside of fallen blocks. Large three-toed *Iguanodon* casts up to half a metre long turn up below the Lee Ness Sandstone near Lee Ness Ledge (BGS memoir).
- **Early mammals:** the Cliff End Bone Bed has given up teeth from some of the earliest mammals of the Cretaceous (BGS memoir).

There is a twist. Coastal erosion is what reveals new footprints, so where sea defences stop the erosion, any prints still inside the cliff stay hidden (University of Cambridge).

Squeezed, lifted and cracked

Long after the dinosaurs, the whole Weald was slowly pushed up into a long dome. Rain and rivers then wore away the top of the dome. That is why the Hastings cliffs are not capped by hundreds of metres of clay and chalk, as you might otherwise expect (BGS).

The squeezing also broke the rocks along **faults**, which are cracks where one block of rock has moved past another. Several cross this coast, including the Foul Ness Fault near Rock-a-Nore, the Ore Fault near Covehurst, and two "reverse" faults at either end of Fairlight Cove, where one side was shoved up over the other (Discovering Fossils).

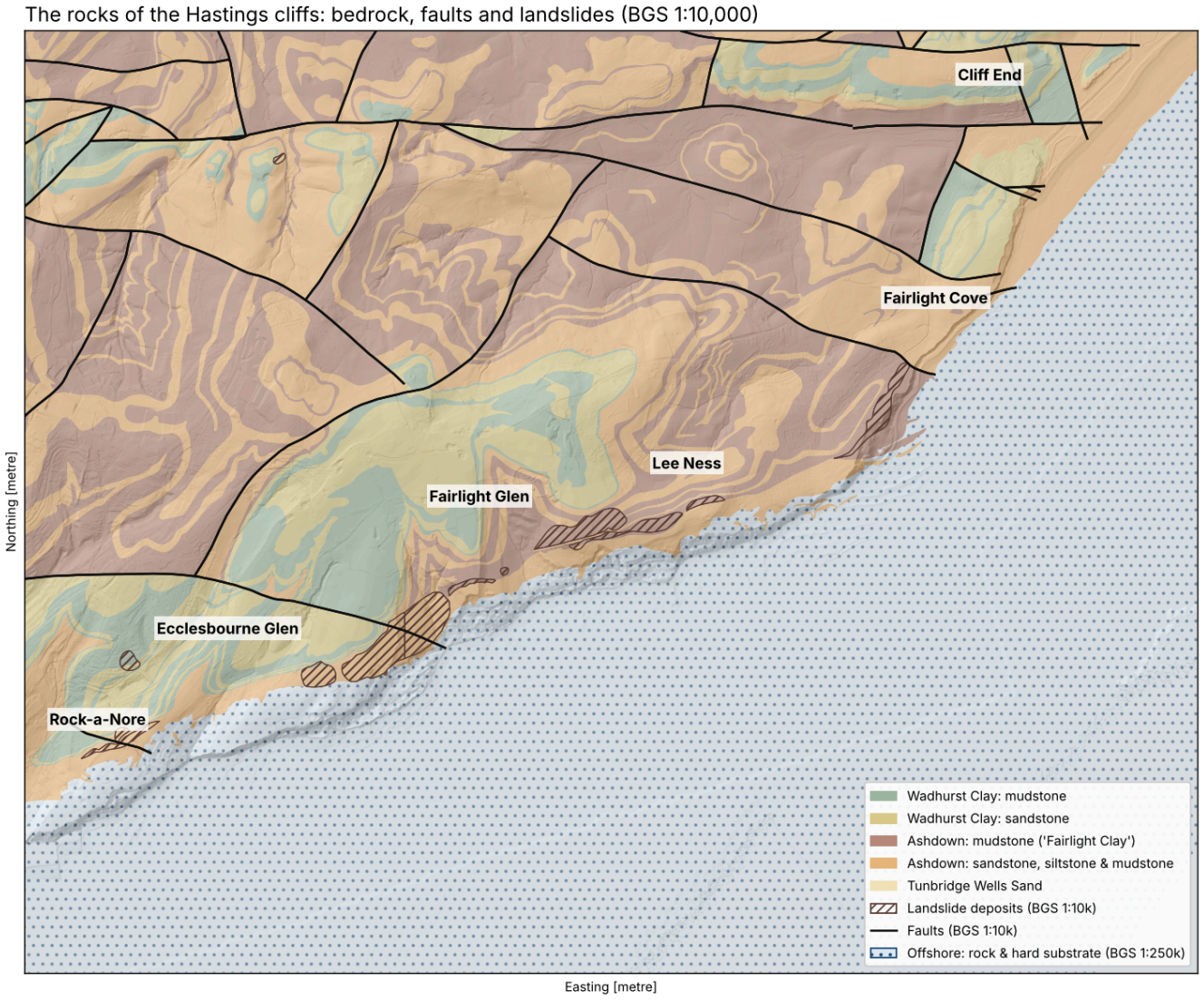


Figure 2.2. The rocks behind the cliffs. Brown areas are the soft Ashdown mudstones ("Fairlight Clay"), orange the stronger Ashdown sandstones and siltstones, green and yellow the Wadhurst Clay. Black lines are faults; hatched patches are mapped landslides. The dotted sea area is classed by the British Geological Survey as rock and hard seabed. Source: BGS 1:10,000 and 1:250,000 geology via Digimap; EA LiDAR.

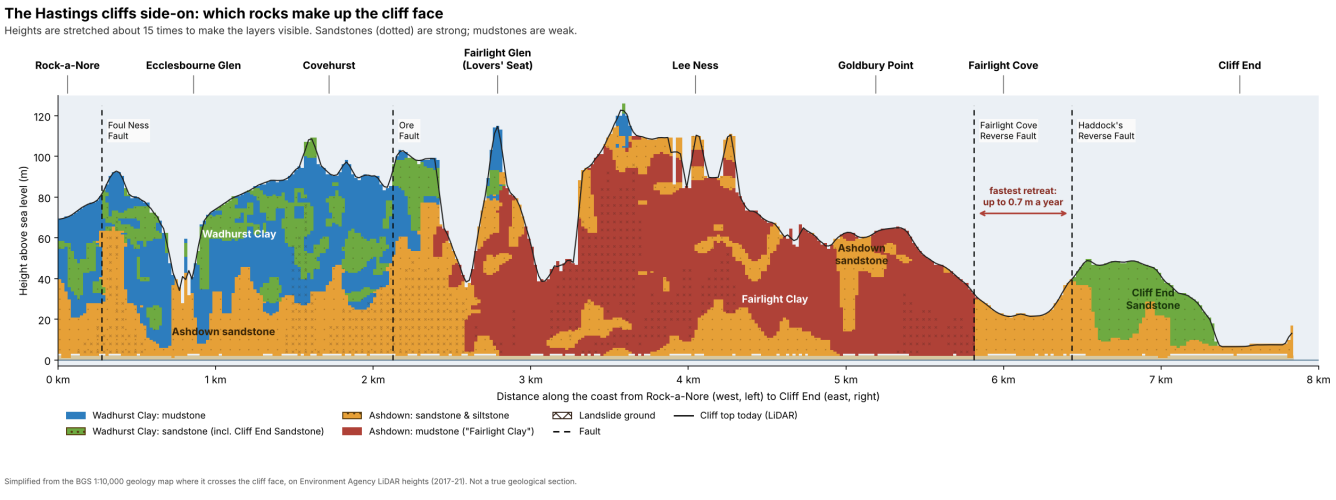


Figure 2.3. The cliffs side-on, from Rock-a-Nore (left) to Cliff End (right), showing which rocks make up the cliff face. At the western end, strong Ashdown sandstone (orange) sits beneath Wadhurst Clay (blue and green). In the middle, the soft "Fairlight Clay" (red) forms most of the cliff around Fairlight Glen and Lee Ness. Faults (dashed lines) break the layers; the fastest-retreating stretch lies between the two faults at Fairlight Cove. Heights are stretched about 15 times. Simplified from the BGS 1:10,000 geology map on Environment Agency LiDAR heights; not a true geological section.

Why this matters for the cliffs today

The rocks explain much of what we see happening now:

- **Hard sandstone** stands up as tall, steep cliffs. It falls in big blocks every so often, but on average it retreats very slowly.
- **Soft mudstone** slumps and slides, especially after heavy rain, and feeds landslides like those at Covehurst Wood and Fairlight Glen.
- **Faults** create weak zones and let groundwater into the cliffs. As Chapter 5 shows, the fastest-retreating stretch of the whole coast sits between two faults at Fairlight Cove.

3. The drowned coast

Only a few thousand years ago the coast here lay further out to sea, and the evidence is still visible at low tide. At the end of the last ice age, sea level was far lower than today. As the ice melted the sea rose, flooding low land and pushing the shoreline inland.

A forest on the beach

At Pett Level, just east of Cliff End, low tide uncovers the stumps and fallen trunks of an ancient forest set in peat. A local naturalist described it as at least 6,000 years old (Sussex Express).

A detailed Historic England study found it is not one forest but trees that grew over about 1,500 years. Peat built up between floods, as the sea broke through a shingle bank that once lay offshore (Historic England report 270/2020). The oldest layers, from the Mesolithic and Neolithic, lie at the top of the beach. The youngest, from the Bronze Age, lie at the seaward edge (CITiZAN). In other words, you can walk through 1,500 years of rising sea in a few hundred metres.

The seabed in front of the cliffs

Offshore, the seabed slopes very gently. It is less than about 18 m deep across a shelf up to 10 km wide (BGS memoir). The British Geological Survey classes the seabed here as rock and hard ground, though its mapping is broad-brush at this scale.

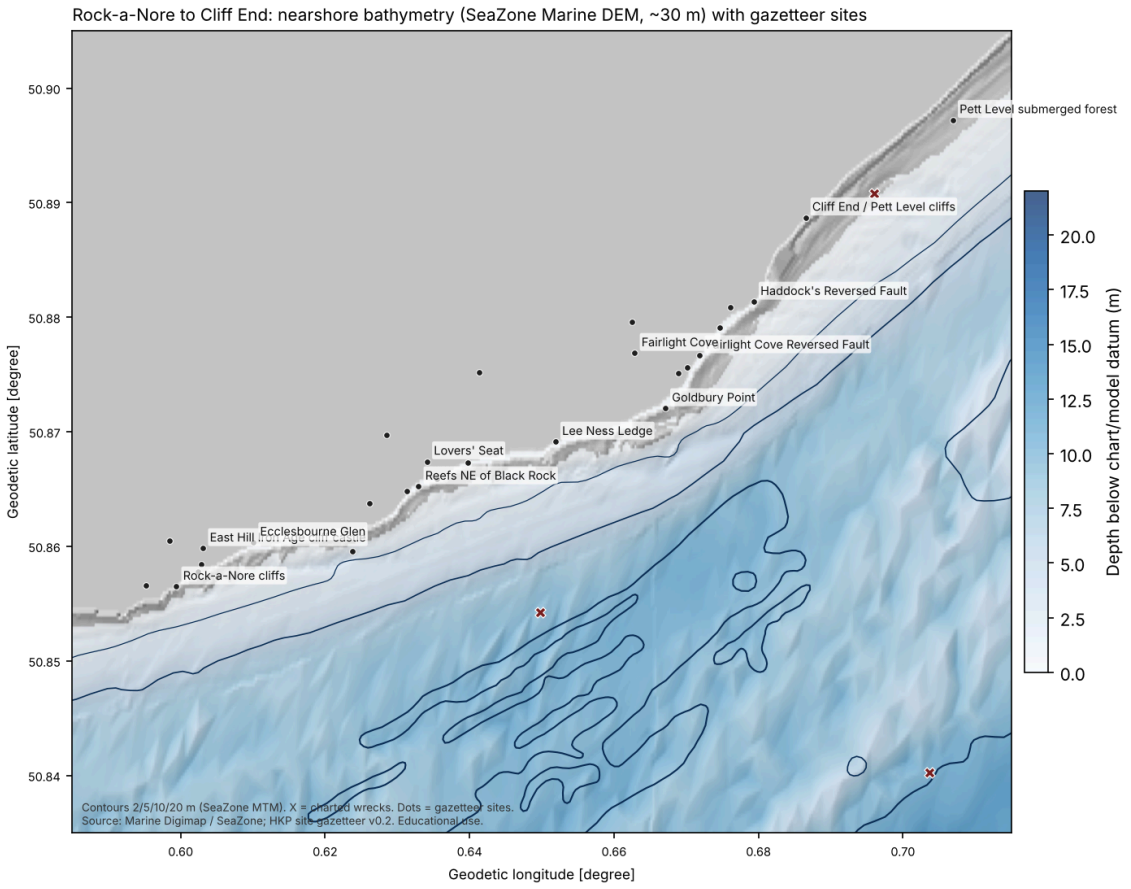


Figure 3.1. Depth of the sea off the cliffs (darker blue = deeper), with depth contours, charted wrecks (X) and the sites in this report (dots). The long ridges 2 to 5 km offshore run parallel to the coast. Source: SeaZone Marine DEM and contours via Marine Digimap.

Two things stand out:

- **Long ridges 2 to 5 km offshore** run roughly parallel to the coast. They may be the hard sandstone layers of the cliffs continuing under the sea, or banks of sand. Nobody has checked.
- **Rock ledges close inshore.** HKP volunteers walking the shore have seen large rock outcrops reaching 500 to 700 m out from the beach. The best existing depth maps are too coarse to show them at all. Further out, about 10 km south of Hastings, the Inner Bank conservation zone protects rocky reef described as the remains of an ancient river system (Sussex Wildlife Trust).

This matters for kelp, which needs solid rock to hold on to. The geology of the cliffs is, in effect, a guide to where the reefs offshore might be.

4. People on the edge

People have lived and played on these cliffs for over 2,000 years, and the sea has taken many of the places they built. Several well-loved landmarks have vanished within living memory.

An Iron Age fort on East Hill

The top of East Hill holds an Iron Age "cliff castle" of about 450 by 200 m, with cliffs on three sides and a large bank on the landward side (Historic England). Forts like this were usually abandoned by the middle of the 1st century AD. Ecclesbourne Glen is thought to have been its landing place (Geograph).

The coastguards of Ecclesbourne

In 1819 the government built a wooden coastguard watch house on a platform beside the stream at Ecclesbourne Glen, to catch smugglers. That spot has since gone into the sea. Storms in 1859 wrecked the station, so a brick replacement was built higher up on the west side of the glen in the early 1860s. Sources differ on the year: Hastings History gives about 1861, and local historian Steve Peak gives 1864 (Hastings Independent Press).

The coastguards left in 1908/09. By 1932 the cliff edge was about 15 ft (4.6 m) from the empty cottages. Landslips in January 1961 undermined them, and between 1962 and 1963 the buildings were pushed over the cliff onto the beach. The final bill to the Council was about £440 (Hastings History).

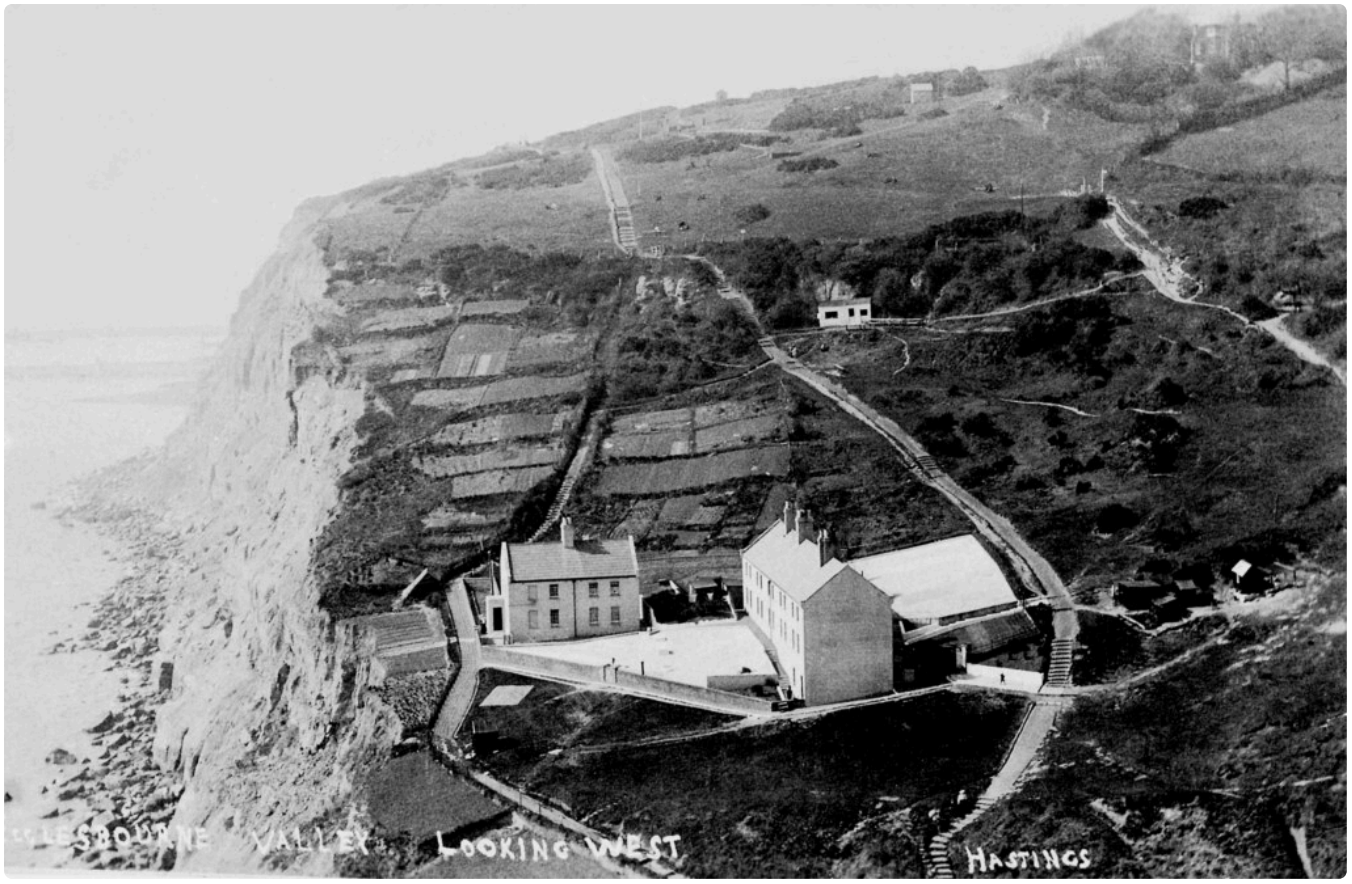


Figure 4.1. "Ecclesbourne Valley looking west, Hastings", a postcard from the early 1900s. The coastguard station and its yard stand right at the cliff edge, with allotment terraces on the slope and paths climbing to East Hill. Every building here has since gone. Photographer and publisher unknown; believed to be out of copyright (see Sources).

The tea rooms

A tea house stood on the cliff edge at Ecclesbourne. Local people remember it still serving in the mid-1950s, run by a couple named Wilkinson (1066online). The same January 1961 landslips undermined it. It sat perched on the edge until late 1962, when local youngsters helped move it onto the beach (Hastings History). One man remembers walking from East Hill to Fairlight as a boy, buying ice cream at a cliff-top café; he says the whole route has since fallen into the sea (1066online).

More photographs of the tea rooms and the coastguard cottages can be seen in the 1066online Old Photo Archive.



Figure 4.2. The tea garden at Ecclesbourne Glen, probably 1920s–30s, looking east past the coastguard cottages to the cliffs towards Fairlight. Photographer and publisher unknown; widely reproduced online and believed to be out of copyright (see Sources).

Can you help? If you or your family have photos of the tea rooms, the coastguard cottages or the old cliff path between East Hill and Fairlight, we would love to hear from you on the HKP forum.

Lovers' Seat

High above Fairlight Glen stood Lovers' Seat, a bench on a rock ledge high up the cliff. It already appears on a map in the Hastings Guide of 1794 (Hastings Country Park Conservation Group). The painter William Holman Hunt painted the spot in 1852 (Tate, via Google Arts).



Figure 4.3. An Edwardian couple on the original Lovers' Seat, a simple bench set against the sandstone, on a hand-coloured postcard from around 1905 to 1910. Courtesy of Gravelroots Vintage Trail.

The best-known legend says that in 1786 a young revenue officer, Charles Lamb, met Elizabeth Boys there in secret before they eloped (historymap wiki). Other versions tell quite different stories, and local researchers who have studied old postcards think most of the tales are Victorian tourist romance rather than recorded fact (Hastings Country Park Conservation Group).



Figure 4.4. Postcard no. 1402, "Lovers' Seat, Fairlight, Hastings", with the legend printed underneath. In this version Elizabeth survives a leap from the cliff and marries the revenue captain who rescues her. Postcards like this helped spread the story to every visitor. Courtesy of Gravelroots Vintage Trail.

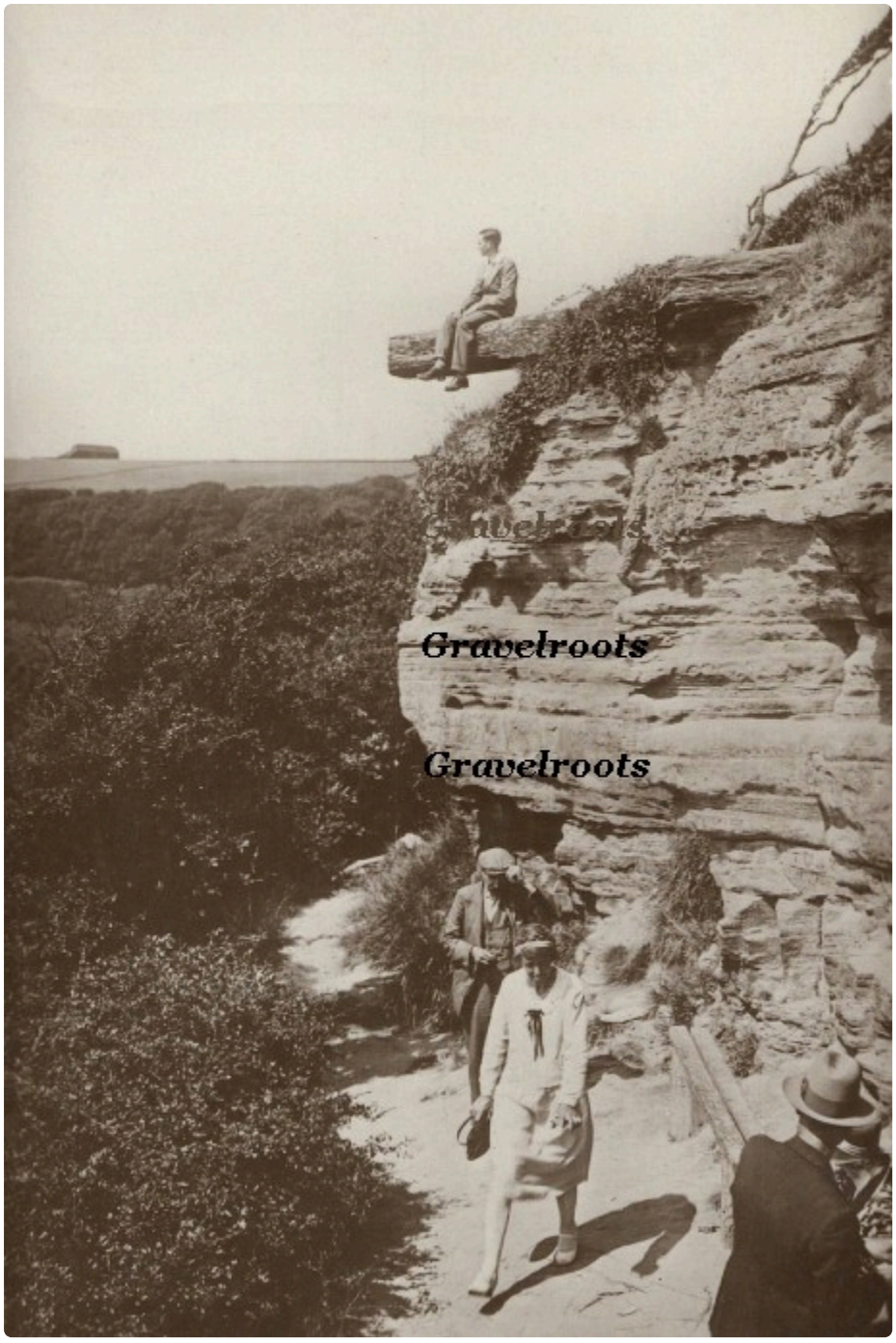


Figure 4.5. Lovers' Seat on a postcard dated 1930: a timber seat jutting out from the sandstone ledge, with visitors on the cliff path below. Everything in this picture has since gone. Courtesy of Gravelroots Vintage Trail.

The seat was lost not once but several times. Old postcards show its story (Hastings Country Park Conservation Group):

Year	What happened
1910	A landslip over several weeks took away the slope in front of the seat and a slab of rock beside it; a fence went up

Year	What happened
Second World War	The seat was reportedly destroyed by the military
After the war	A new seat was paid for by a Mrs L C Pridaux
December 1960	The seat was fenced off for safety
February 1961	Ledge and seat lost in a landslip
March 1961	A new site was chosen nearby
1979	The new site was swept away too (some accounts say 1981)

Today nothing remains to see.

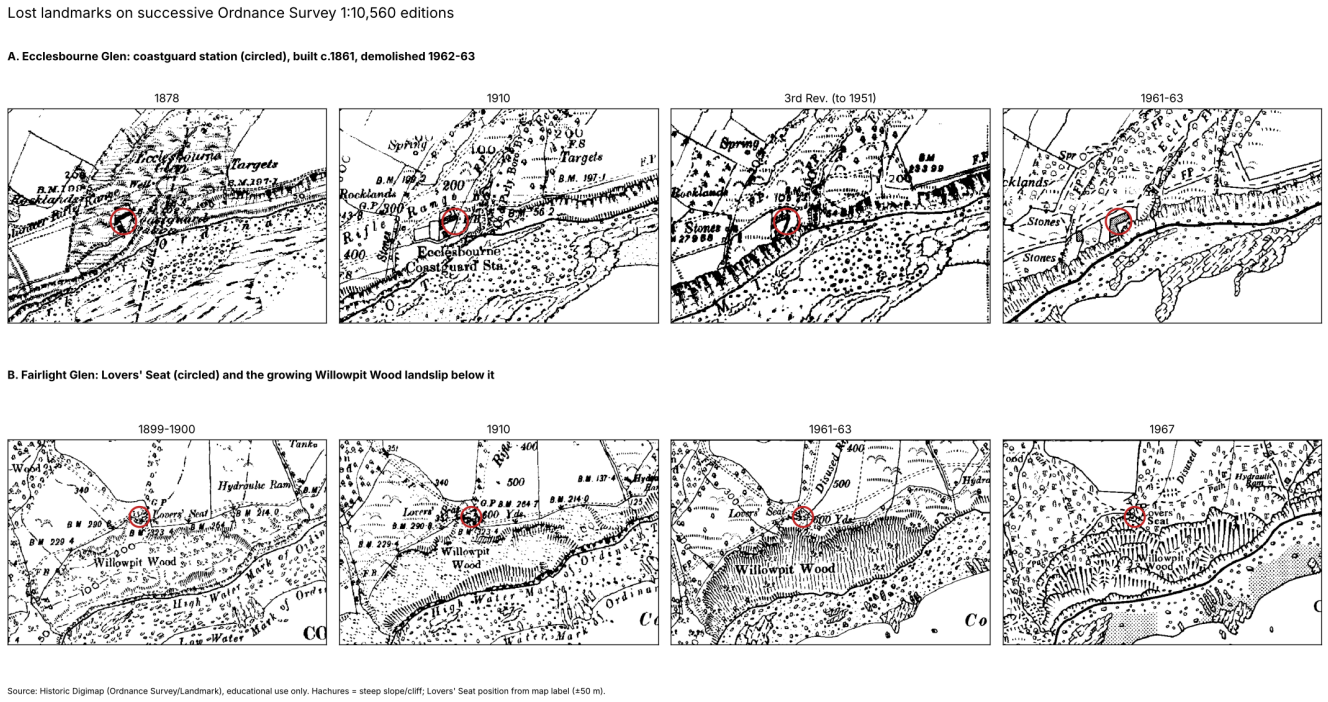


Figure 4.6. Lost landmarks on successive Ordnance Survey maps. Top: the Ecclesbourne coastguard station, from 1878 to 1961-63. Bottom: Lovers' Seat, with the Willowpit Wood landslip growing below it. Source: Ordnance Survey via Historic Digimap.

Fairlight Cove: homes on the edge

The old maps show farmland at Fairlight Cove until at least 1910. Rows of bungalows first appear on the edition revised in the 1920s to 1940s, built on a cliff that was already retreating by around half a metre a year (Chapter 5).

By 1987, residents reported about 4 ft (1.2 m) of land vanishing every year, and 11 houses on Sea Road were expected to go by 2000 (University of Sussex Coastview). Six houses on Sea Road were lost in the late 1980s and early 1990s. On Rockmead Road one bungalow

became uninhabitable in 1998 and went over the cliff in 1999 (Hastings Observer).

More pictures: old photographs and postcards of these places are held by the 1066online photo archive, Francis Frith, Historic England and Britain from Above. They are listed in the HKP image log; most need the owner's permission before they can be reproduced here.

5. A century and a half of retreat

Our measurements show that since 1878 the cliff top has moved back by less than 10 m at Rock-a-Nore but by up to 100 m at Fairlight Cove. Erosion along this coast is anything but even.

How we measured it

We compared the position of the cliff top on six sets of maps and surveys:

- Ordnance Survey maps published in 1878, 1899, 1910, a revision made between the 1920s and 1951, and 1961-63.
- A modern laser survey of the ground from the air (**LiDAR**) flown by the Environment Agency between 2017 and 2021.

We drew 78 lines at right angles to the coast, every 100 m from Rock-a-Nore to Cliff End. On 22 of them, spread along the whole coast, we read where the cliff top crossed the line on each map. The difference between 1878 and today, divided by the years in between, gives an average **retreat rate** in metres per year.

Old maps are not perfect. Each reading is good to roughly plus or minus 15 m. So the long-term rates are reliable, but changes over a few decades are rough. The stable cliff at Cliff End, which appears to have moved "forwards" by about 10 m, shows the size of that error.

What we found

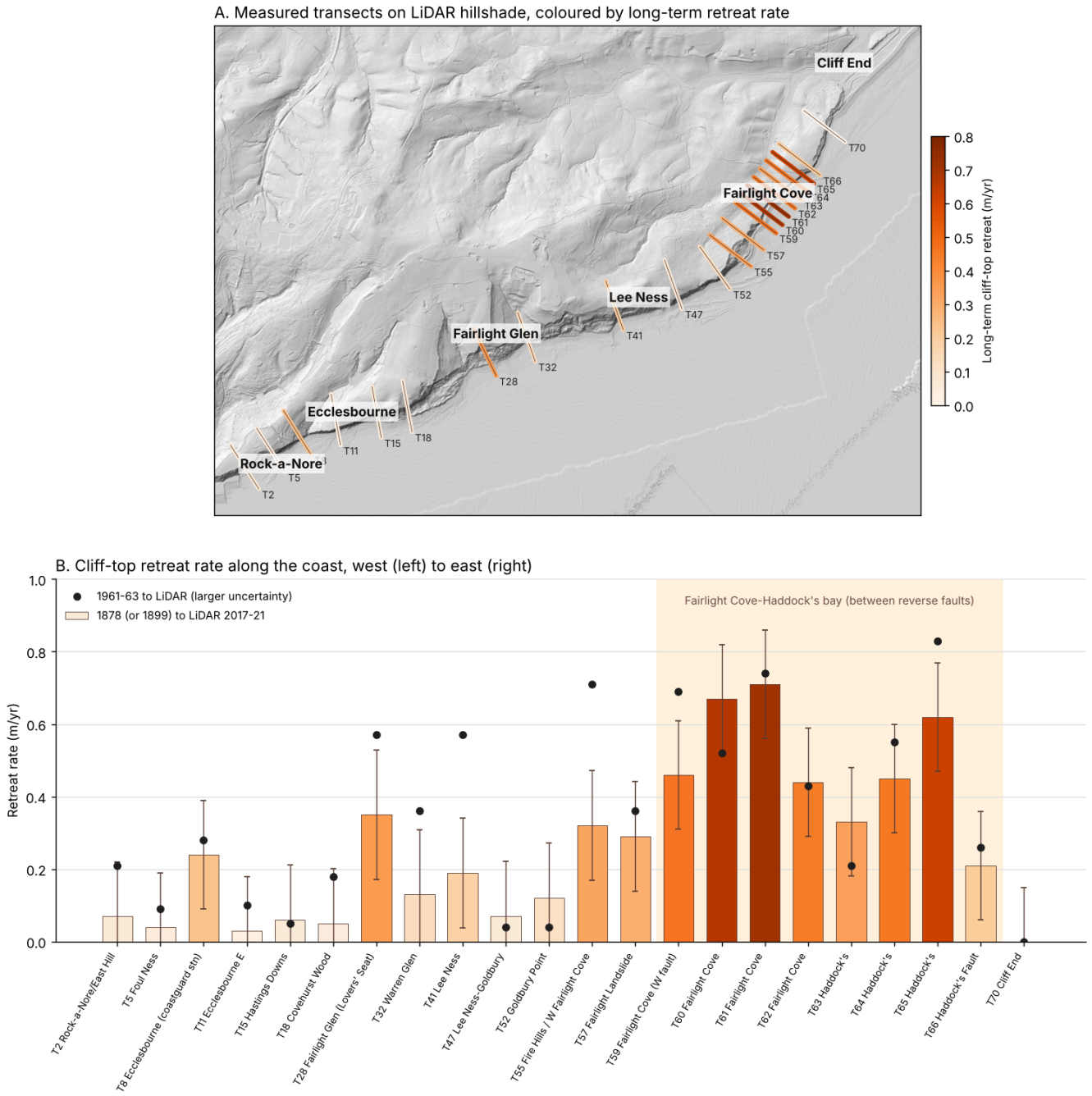


Figure 5.1. Top: the 22 measured lines, coloured by how fast the cliff top has retreated. Bottom: the rate on each line, west to east. Bars = 1878 to today; dots = 1960s to today. Source: HKP analysis of Ordnance Survey maps (Historic Digimap) and Environment Agency LiDAR.

Section	Retreat since 1878	Average rate
Rock-a-Nore, Foul Ness, Covehurst	4 to 10 m	about 5 cm a year
Ecclesbourne (coastguard station)	about 34 m	about 24 cm a year

Section	Retreat since 1878	Average rate
Fairlight Glen (Lovers' Seat)	about 42 m (since 1899)	about 35 cm a year
Fire Hills and Fairlight Landslide	40 to 45 m	about 30 cm a year
Fairlight Cove to Haddock's	60 to 100 m	45 to 70 cm a year
Cliff End	no measurable change	close to zero

These figures agree well with earlier estimates of about 0.3 m a year at Ecclesbourne and 0.6 m a year at Fairlight Cove (Villagenet, citing Cleeve and Williams).

Why the difference?

The rock type explains part of it. The strong sandstone and Wadhurst Clay cliffs at Rock-a-Nore and Cliff End have barely moved. The soft mudstone cliffs from Fairlight Glen to the Fire Hills retreat faster, mostly through landslides.

But the fastest stretch, Fairlight Cove to Haddock's, is not the softest rock on the geology map. What makes it different is that it sits **between two faults** and has the **lowest cliffs on the coast**, about 25 m high compared with 65 to 100 m elsewhere. Groundwater is a big part of the story. Engineers found the slopes were being destabilised by water pressure inside the clays, silts and sands (WJ Group).

Interestingly, the national coastal erosion rating from the British Geological Survey (GeoCoast) gives every one of our 22 lines the same score, "Moderate". Local measurements like these pick up differences that national maps cannot.

Major events

Date	Place	What happened
14 Aug 2026	Rock-a-Nore	Significant cliff slip; coastguard and rescue boat searched the beach; no one hurt (Sussex Express)
3 Jan 2014	Rock-a-Nore	Thousands of tonnes collapsed after a stormy, wet winter, caught on video (AGU Landslide Blog)
2013-14	Ecclesbourne Glen	Landslip below Rocklands caravan park closed footpaths for years (Hastings Online Times)

Date	Place	What happened
23 Jul 2013	Rock-a-Nore	Large fall in dry weather (Hastings Online Times)
2004	Fairlight Cove	Landslides up to 60 m high (GCG)
1999	Rockmead Road, Fairlight Cove	Bungalow fell over the cliff
Late 1980s to early 1990s	Sea Road, Fairlight Cove	Six houses lost
1979	Fairlight Glen	Replacement Lovers' Seat lost
Jan to Feb 1961	Ecclesbourne and Fairlight Glen	Coastguard station, tea house and Lovers' Seat undermined or lost

6. Defending the coast

Most of this coast is deliberately left to erode naturally; only Fairlight Cove is defended, after a long fight by residents. The protected cliffs either side are valued for their rocks and fossils, which erosion keeps fresh.

The fight for Fairlight

In the mid-1980s, consultants for Rother District Council concluded that full defences at Fairlight could not be justified on cost. Residents formed a preservation association in 1987 (University of Sussex Coastview). In 1988 Fairlight became the first community to use a section of the Coast Protection Act 1949 to push its council into action (RICS library, Daily Telegraph 1988). The government eventually approved a £2.2 million scheme after an 11-year campaign.

Three rock barriers and a drainage system

Year	Scheme	Details
1990	Stage I, Sea Road	540 m rock barrier of Norwegian granite at the foot of the cliff (SE Coastal Group)
2007-08	Stage II, Rockmead Road	275 m barrier of French limestone (SE Coastal Group), plus reshaped slopes and 56 wells pumping water out of the cliff (WJ Group)

Year	Scheme	Details
2016	Stage III, the gap	270 m barrier of 22,500 tonnes of Larvik granite filling the gap between the first two; about £1.8 million, including £75,000 each from the Fairlight Preservation Trust and Fairlight Parish Council (SE Coastal Group)

The rock barriers stop waves eating into the foot of the cliff. The wells tackle the other half of the problem: water trapped in the ground, which makes the slopes slide.

The rules today

Each stretch of coast has an official long-term plan, called a **Shoreline Management Plan**. Here it means:

- **Central Fairlight Cove:** "hold the line", keeping and maintaining the defences, until 2056 (SussexLive).
- **Everywhere else:** "no active intervention", meaning nature takes its course.

Since 2021, Rother District Council has banned soakaway drains within 50 m of the cliff edge at Fairlight Cove, because water in the ground makes slips more likely (Rother DC). In 2026 the council agreed to fund an overhaul of the cliff pump system (Sussex Express).

7. What to expect next

The cliffs will keep retreating, and the big question is what happens at Fairlight Cove when today's defences reach the end of their working life. Rising seas and stormier winters are likely to make things worse, not better.

If past rates continue

A simple sum, using our measured rates, gives a rough idea of how far the cliff top could move between now and 2100. It assumes the next 75 years behave like the last 140, which they may not.

Section	Recent average rate	Possible retreat by 2100
Rock-a-Nore and East Hill	about 5 cm a year	a few metres, mostly in sudden falls
Fairlight Glen and Fire Hills (undefended)	30 to 35 cm a year	about 20 to 30 m

Section	Recent average rate	Possible retreat by 2100
Fairlight Cove (defended)	45 to 70 cm a year before the defences	depends on the defences being kept up

Fairlight Cove's future

The 2007 works were designed to last about 50 years (Wikipedia: Fairlight), and the official plan is to hold the line until 2056 (SussexLive). Without defences, engineers in the 2000s expected retreat of up to 1.5 m a year (GCG). A 2022 study of national data put the coast between Fairlight Cove and Cliff End among England's worst affected, with about 43 homes, worth over £26 million, at risk by 2100 (Sussex Express).

Why the future may be faster

- **Higher seas** let waves reach the foot of the cliffs more often.
- **Wetter winters** raise groundwater, the main trigger for landslides here. The January 2014 Rock-a-Nore fall followed weeks of exceptional storms and rain (AGU Landslide Blog).
- **Hot, dry spells** crack the rock. Hastings Borough Council warned that the dry weather had made the cliffs more likely to collapse after the July 2013 fall (Hastings Online Times).

8. Kelp and the coast: what we know and what we don't

Kelp will not save the Hastings cliffs, but it may help a little at their foot, and it would bring many other benefits to this coast. It is important to be honest about the limits.

What the research says

Kelp forests do calm waves, but only modestly. A careful study in California measured waves on the same reef before and after a giant kelp forest grew. The seabed alone reduced wave energy by about 12%; the kelp added about 7% more (Elsmore et al. 2023, Annals of Botany). The authors concluded that kelp has a limited, though measurable, ability to protect shorelines, and that big hopes of erosion control from kelp may need rethinking.

Kelp works best on small, short waves. Another study found kelp canopies filter short waves strongly, especially in summer and at low tide when more fronds reach the surface (Limnology and Oceanography Letters). Big storm waves, which do the real damage, are much less affected, and they can rip kelp out.

What this means here

- **Most of the cliff loss here is not caused by waves alone.** At Fairlight Cove, water inside the ground is a major cause of landslides (Chapter 5). Kelp cannot change that.
- **The fastest-eroding stretch already has rock defences.** Kelp offshore would add little there.
- **Kelp could still help at the margins.** On undefended stretches, a kelp bed on the rock ledges could take some energy out of everyday waves before they reach the beach and the foot of the cliffs.

Why kelp still matters for this coast

Coastal protection is a small part of the case for kelp. Kelp forests provide shelter and food for fish, crabs and lobsters, nurseries for young fish, and cleaner water, and they lock up carbon. Old fishermen on this coast say there used to be kelp off Hastings. Bringing it back is about restoring a lost habitat, with any help to the coast a bonus.



Figure 8.1. Sugar kelp (Saccharina latissima) cultures, female (36) and male (37) stocks, from the Seaweed Nursery, week starting 19 October 2026, with the Rock-a-Nore cliffs behind. Photo: Hastings Kelp Project.

The honest position

We think the right question is not "Can kelp stop erosion?" but "How much does a kelp bed change the waves reaching this particular beach?" That can be measured, and Chapter 9 suggests how.

9. Open questions for you to explore

These are questions this report raises but cannot answer. Each one could be tackled by a curious local, a school group or a student. If you take one on, tell us on the HKP forum so we don't double up.

No.	Question	Idea to test	How you could start	Skills needed
1	Why is Fairlight Cove retreating fastest?	Low cliffs between two faults lose ground faster than high cliffs elsewhere, whatever the rock type	Compare retreat with cliff height and distance from faults along all 78 lines	Maps, spreadsheets
2	What happened between 1951 and 1961, and 1963 and 2017?	Retreat came in bursts, after wet winters, not steadily	Add the 1946 RAF aerial photos and 2006 aerial survey as extra dates	Comparing old photos
3	Finish the map	The 56 lines we did not measure follow the same pattern	Use our method and files to read the remaining lines	Patience, a laptop
4	What are the rock ledges offshore?	The inshore ledges are the hard sandstone layers of the cliffs continuing under the sea	Low-tide walks with GPS and photos; compare with the geology map	Fieldwork, safety awareness

No.	Question	Idea to test	How you could start	Skills needed
5	Is the water murkier off the clay cliffs?	Landslides from the soft cliffs cloud the water and cut the light kelp needs	Secchi disc or turbidity readings at fixed points off sandstone and clay stretches	Simple fieldwork, a boat or pier
6	Did kelp once grow here?	Kelp grew off Hastings within living memory	Record fishermen's memories; search old surveys, charts and photos	Interviews, archives
7	How much would a kelp bed calm the waves here?	A kelp bed on the inshore ledges cuts everyday wave energy reaching the beach	Wave loggers inside and outside a kelp patch, or a scale model in a tank	Science kit, data analysis
8	Where exactly were the tea rooms?	The tea house stood on the east side of Ecclesbourne Glen	Search 1:2,500 Ordnance Survey maps, directories and family photos	Local history
9	When were the Fairlight Cove bungalows built?	Most were built in the 1920s and 1930s, after the cliff was known to be retreating	Planning records, sales particulars, old maps	Local history, archives
10	Are more dinosaur footprints being revealed?	Fresh falls at Lee Ness and Goldbury Point uncover new prints each winter	Regular photo surveys of fallen blocks (never climb or hammer the cliff)	Photography, fossil ID

All our data files, maps and methods are available to anyone who wants to build on this work.

Sources, data and image credits

Data used in our own analysis

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Figures

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