Case Study 3 - South-East Coast of England

3.1. Introduction

The south-east England case study site comprises two coastal frontages drawn from Kent and East Sussex. The Kent case study site extends from the historic ruin of Reculver Church to the east of Herne Bay on the north Kent coast, eastwards past the seaside resorts of Margate, Broadstairs and Ramsgate, and south from Pegwell Bay to Deal, a total distance of approximately 50km (32 miles). The site is located entirely within the county of Kent, and is bounded on the north by the mouth of the Thames Estuary and to the east by the North Sea.

The second study site is the historic town of Hastings, which is situated on the coastline of East Sussex approximately 21km (16 miles) to the east of the larger seaside town of Eastbourne. The study site comprises Hastings main beach, and the beach and cliffline to the east of the seafront. The case study sites include landscapes of environmental and heritage interest, which are affected by coastal erosion. A further feature common to both sites is their rich art heritage, extending from the late eighteenth century.

3.1.1. Geology and Geomorphology

The Kent case study site lies within the North Kent Plain, which comprises a strip of land between the Thames Estuary to the north and the chalk of the Kent Downs to the south (Natural England, 2012[1]). Along the length of the case study site the coastline changes from a northern coastal aspect to a north-easterly and then easterly facing shore. Along this relatively short section of coast there is a wide range of habitats, which include chalk cliffs on the Isle of Thanet, and softer cliffs between Herne Bay and Reculver, such as those found at Pegwell Bay. To the south there are intertidal sands and mudflats, saltmarshes and sand dunes together with shingle beaches, brackish lagoons and maritime grasslands on cliff tops, and seawalls (Natural England, 2012[1]).

The underlying geology comprises fine sands of the Thanet Sands Formation, with clays of the Thames Group to the west, and a chalk headland extending to North Foreland to the east of Margate. South of the chalk outcrop, which extends down to Ramsgate, the Thanet Sands outcrop before the chalk of South Foreland appears.

At Hastings the cliffline comprises mudstones, sandstones and silt flats of the Wealden Group; a location characterised by eroding soft cliffs of sands and clays, which are designated for their environmental importance. In fact, the eroding sea cliffs at Hastings provide one of the finest exposures of Lower Cretaceous and Wealden sediments to be found around the British coast and they are richly fossiliferous.

Both of the south-east of England case study sites are designated at international, European and national levels for their nature conservation importance, as well as having a particularly rich coastal heritage, including important churches and fortifications.

3.1.2. Coastal Processes

Since north and east Kent were affected by the devastating floods of 1953, close attention has been paid to the issues of coastal risk management around this coastline. More recently, two Shoreline Management Plans (SMPs) were completed covering the coastline from the Isle of Grain at the mouth of

the Thames Estuary, eastwards to South Foreland (South-East Coastal Group, 2008[2]), with a second plan extending from South Foreland around the east Kent coast and westwards along the south coast towards Beachy Head (South-East Coastal Group, 2006[3]). These plans have provided a strategic framework for the management of risks along this diverse coastal zone, identifying preferred policies, which allow cliff retreat on the undefended chalk cliff frontages, to the benefit, for example, of natural cliff habitats. In the case of the low-lying frontages opportunities are being sought to manage losses arising from 'coastal squeeze' through the creation of compensatory habitats.

Along the Hastings frontage, the town itself is protected by a range of defences, which have existed as far back as the fourteenth century. The intention is to continue to maintain and upgrade defences, where necessary, over the next century. From the eastern end of the town, eastwards towards Fairlight and Fairlight Cove beyond, the high sandstone cliffs are subject to continuous weathering and erosion. Where there is minimal development along the cliff top the natural processes of erosion and weathering will be allowed to continue, and certainly the eroding cliffs contribute to the overall sediment supply available along this part of the Sussex coast. However, at Fairlight, there has been significant loss of properties historically as a result of cliff retreat and cliff top instability problems. This has resulted in coast protection works and cliff drainage being undertaken to reduce the impact of these processes. The intention is to continue to defend those frontages where it is economically justifiable and environmentally acceptable to do so.

3.1.3. The Coastal Environment

The coastal zone of the Kent case study site lies within the North Kent Plain, which is a strip of land extending from the Thames Estuary to the north, to the chalk of the Kent Downs to the south (Natural England, 2012[1]). It is an area with a diverse range of coastal habitats, including chalk cliffs found around the Isle of Thanet and soft cliffs to the west between Herne Bay and Reculver and also at Pegwell Bay. Extending southwards past the chalk frontage, there are intertidal sand and mudflats, saltmarshes, sand dunes, such as those in Sandwich Bay, and shingle beaches along the Deal frontage. This part of the Kent coast is of considerable environmental importance, with a range of designations, including the Sandwich Bay SAC (Special Area of Conservation) and the Thanet Coast SAC, which is designated for the chalk reefs and submerged or partially submerged sea caves. The Thanet coast and Sandwich Bay are also designated as a RAMSAR site, reflecting the wetland invertebrates and winter bird populations that they support. The designation of Special Protection Areas also reflects both the ornithological and invertebrate interest of this coastal frontage (Natural England, 2012[1]).

The contrasting geology of the East Sussex coast in the vicinity of Hastings, where the Weald meets the sea, has led to the designation of Hastings Cliffs as a Special Area of Conservation notable for an area of relatively undeveloped coastline, which consists of actively eroding soft cliffs of sands and clays. The 6km section of eroding sea cliffs at Hastings in fact provide one of the finest exposures of the Lower Cretaceous and Wealden deposits to be found in Great Britain. Fossil plant material and non-marine animal fossils are some of the best examples of Type species to be found. A key aim of environmental management for this frontage is, therefore, to conserve the coastal zone, including its geological, geomorphological and biodiversity assets, allowing, where practical, for the continuation of natural coastal processes along the unprotected frontages, which are of particular biological and geological importance (Natural England, 2012[1]).

3.1.4. Coastal Art History

Along the north Kent coast, the most distinctive historic landmark is the twin towers of Reculver's ruin and St Mary's Church. The area surrounding the towers was the site of the Roman fortress Regulbium, which was built in the third century A.D. to guard the northern end of the Wantsum Channel, which once separated the Isle of Thanet from the mainland of Kent. A monastery stood on this site in A.D. 669, which, with the church, was located inside the fort. The towers of the site today date from a

reconstruction in the twelfth century. Most of this historic church was demolished in the early nineteenth century, when it was threatened by coastal erosion but because the towers were regarded as important navigational aids they were later restored by Trinity House.

The seaside resorts of Margate, Broadstairs, and Ramsgate to the east and to the south, contain excellent examples of eighteenth and nineteenth century architecture, dating from the mid-eighteenth century when Londoners were attracted to the seaside. Apart from the historic site at Reculver, the east Kent coast has a particularly rich heritage in terms of military sites, including the Saxon Richborough Castle (A.D. 285) and Henry VIII's castles on the shoreline at Deal and Walmer. At Hastings in East Sussex, this location was a flourishing harbour town even before the Romans landed to the west and, by the Tudor period, the town was one of the Cinque Ports (together with Dover, Hythe, Romney and Sandwich). Hastings Castle, located on the West Hill, dates from Norman Times and is a ruin. It overlooks the harbour area known as 'The Stade', where fishermen's boats are winched ashore. These are located close to the black storage sheds known locally as 'net shops' and constructed for the purpose of drying nets.

One of the earliest, finest topographical paintings of the region was a '*View of Dover*' by Richard Wilson RA (1714-1782), a founder member of the Royal Academy. This work marked the start of a long tradition of coastal landscape art in south-east England. In the early 1820s William Daniell included numerous delicate aquatints of the Kent and Sussex coasts in his *'Voyage Round Great Britain'* (Daniell & Ayton, 1814-1825[4]).

After visiting Margate, Broadstairs, Ramsgate and the fortifications at Deal and Walmer Castle Daniell produced views of the expanding ports and resorts including Dover, Folkestone, Hastings, Brighton and Worthing, and on to Littlehampton, Bognor and Portsmouth. J. M. W. Turner was also working along the coastline of southern England in the early nineteenth century producing watercolours for inclusion in '*Picturesque Views of the Southern Coast of England*' (Cooke, 1826[5]). Over this period, he painted at Margate, Ramsgate, Whitstable, Dover, Folkestone, Deal and Hythe in Kent, whilst in Sussex he painted at Rye, Pevensey, Hastings, Shoreham and at Portsmouth in Hampshire.

At Pegwell Bay close to Ramsgate on the east coast of Kent, the Pre-Raphaelite artist, William Dyce RA HRSA (1806-1864), painted his celebrated view of the Bay in 1858, illustrating the chalk cliffline, and the beach in minute detail. Later, Thomas Bush Hardy RBA (1842-1897) painted one of his best watercolours there entitled '*Shipping off Ramsgate*', whilst just to the north the marine and coastal artist, John Callow (1822-1878), painted '*A Breezy Morning at Broadstairs'*.

At Deal, Anthony Vandyke Copley Fielding POWS (1787-1855) followed in Daniell's footsteps and painted a watercolour looking northwards along the beach towards the castle with a fishing boat in the foreground.

The waters around the Kent coastline and the eastern English Channel, busy with shipping, provided subject matter for numerous artists. Marine painters Clarkson Stanfield RA (1793-1867), Copley Fielding, Dominic Serres RA (1722-1793), Nicholas Pocock OWS (1740-1821), Nicholas Condy (1793-1857) and Robert Cleveley (1747-1809) all painted views in the vicinity of Deal and off Dover (Hemming, 1988[4]). On land the early landscape and architectural watercolourist, John Varley OWS (1778-1842), painted '*Cornfields at Folkestone*' (c.1820s), whilst Thomas Charles Leeson Rowbotham RI (1823-1875) painted the cliff top scenery at Dover. Frederick William Watts (1800-1862) painted a fine pair of views of '*Dover Castle*' from Shakespeare Cliff and from above the town showing the militia marching up the steep hill towards the castle. The Kentish chalk cliffs were a favourite location for the animal painter Thomas Sidney Cooper RA (1803-1902) with groups of cattle often depicted adjacent to the cliff edge thus allowing the beach and the sea to add to the composition. Another artist painting on the south Kent coast was Henry Pether whose '*Sandgate Castle near Folkestone'* looks along the coastline and out to sea by moonlight.

Relatively easy access from London encouraged artists to paint the coastal scenery of Sussex and the activities of fishermen at Rock-a-Nore, where The Stade beach meets the high brown sandstone cliffs. It is believed that almost every member of the Old Watercolour Society visited and painted the coastal scenery at Hastings. Peter De Wint OWS (1784-1849) exhibited a panoramic watercolour drawing of '*Hastings from the East* Cliff' at the Society of Painters in Watercolours in 1825 (No. 228) whilst John 'Jock' Wilson chose to paint the town from the beach in front of the sea wall in 1853. The fishing community at the eastern end of the seafront and the activities on the foreshore proved a particular attraction for artists with David Cox OWS (1783-1859) painting '*On the Shore at Low Tide, Hastings – Boatmen Unloading Sheep into* Carts' in 1827. George Bryant Campion (1796-1870) painted '*Fishermen and Boats on the Shore at Hastings'* in 1849 whilst Frank Dillon RI (1823-1909) chose a similar subject '*Fishing boats on the Beach, Hastings'* beneath the rugged sandstone cliffs.

John Mogford RI (1821-1885), who is well known for his accurate portrayals of coastal scenes also visited Hastings during the 1840s and 1850s. William Henry Borrow (fl.1863-1893), who lived in Hastings from 1876, made an important contribution to the art heritage of the town, producing a series of detailed oil paintings showing the seafront, the beach and the cliffline from different aspects. In 1901 Charles A. Graves (fl.1900s) painted *'The remains of the Elizabethan Harbour at Hastings'*, which shows the relics of the structure located well down on the lower foreshore.

The fashionable resort of Brighton was painted from the beach, the pier and from the downs behind. Thomas Hearne (FSA (1744-1817) painted a pair of detailed watercolours of '*Brighton Looking Towards Hove'* and '*Brighton Beach Looking Towards Kempton'*. George Bryant Campion painted polite society and the splendours of Brighton's Regency architecture at '*Lewes Crescent'* in about 1838. Finely detailed architectural watercolours of Brighton were also painted by William Alfred Delamotte (born 1805) showing the seafront and a view looking east from Adelaide Crescent and Brunswick Lawns. Frederick Nash OWS (1782-1856) produced a pair of watercolours of '*The Crescent with the Royal Chain Pier'* and '*The Promenade, Brighton towards Hove from Brunswick Lawns'* in the 1830s. He also painted a set of six street panoramas and a view of Regency Square in 1854.

Another prolific painter of Sussex coastal and harbour scenes was Richard Henry Nibbs (c.1816-1893) whose views include the entrance to Newhaven Harbour and Bosham near Chichester. He also painted *'Shoreham'* in 1885 as did James Webb (1825-1895) in 1886 and Sir David Murray RA HRSA RSW RI (1849-1933) in 1909. Henry H. Parker (1858-1930) painted a harvesting scene '*On the Sussex Coast near Worthing'* in about 1875 where a painter of marine and coastal scenes, Frederick James Aldridge (1850-1933) resided.

3.1.5. Case Studies

There are six case study sites examined for South-East England; these are:

- Reculver Church, North Kent coast;
- Margate, North Kent;
- Pegwell Bay, Kent;
- Deal Castle, Kent;
- Walmer Castle, Kent;
- Hastings, East Sussex.

References

1. Natural England, 2014. *'North Kent Plain National Character Area Profile'*. www.natural-england.org.uk.
2. South-East Coastal Group, 2008. *'Isle of Grain to South Foreland SMP2'*.
3. South-East Coastal Group, 2006. *'South Foreland to Beachy Head SMP2'*.
4. Daniell, W. & Ayton, R., 1814. '*A Voyage Round Great Britain'.* Longman & Co. London.
5. Cooke, W. B., 1826. 'Picturesque Views of the Southern Coast of England'.

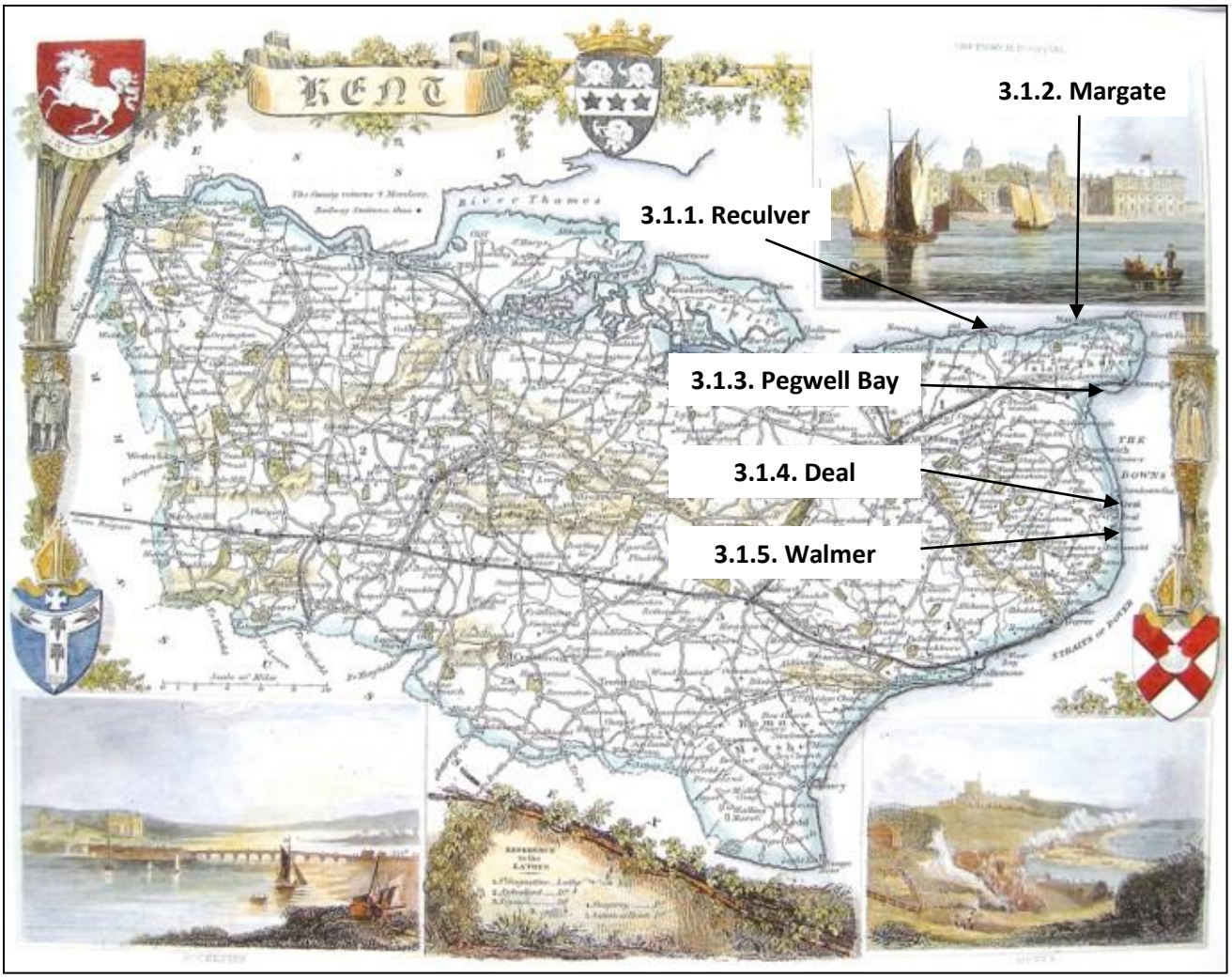


Fig. CS3.1.1. *'Map of Kent'* by Thomas Moule. 1830. Showing Kent study sites.

Case Study 3.1.1. – Reculver Church, North Kent

1. Location

This study site is Reculver Church (Towers) situated 5km to the east of the seaside resort of Herne Bay on the North Kent coast.

2. Why was the Case Study Site selected?

The study site illustrates historical problems associated with erosion of the soft cliffs at this point, and is particularly well illustrated through a chronology of landscape paintings, produced since the early nineteenth century. It is believed that these artworks illustrate clearly how historical information can be gained to inform us of the rate and scale of long-term coastal change.

Fig. CS3.1.2. *'Reculver Church'*, North Kent coast by William Daniell, RA engraved in 1824. Some rudimentary coastal defences can be seen, which were helping to preserve this important landmark for navigation. A substantial rock revetment now protects the site (**Fig. CS3.1.3. above left**).

3. Summary of the Geology, Geomorphology & Coastal Processes

The site is located on eroding soft clay cliffs composed of the London Clay of Tertiary Age. Immediately to the east are the Thanet Beds, which are named after this part of the Kent coast which has historically been known as the Isle of Thanet, whilst, to the south and the east are extensive outcrops of chalk. The geology represents a fixed sequence of sands, clays and chalk, which have been gently folded into an anticline known as the Wealden Dome.

The eroding cliffs at Reculver (except immediately in front of Reculver Towers) are of high conservation and landscape importance. The long-term policy is to allow continued erosion of the cliffs, which will maintain the geological exposures and the landscape quality of the frontage. There will, however, be

potential for loss of buried unknown heritage as the cliffs erode and retreat. Development along this frontage is minimal, and in most cases the built assets are set well back from the cliff face. However, in the medium term, some assets may be at risk and the coastal footpath will need to be re-routed.

4. How can the art imagery resources inform us of changes that have affected this coastal zone?

The historic church of St Mary at Reculver has been depicted by numerous artists over the last 200 years. In 1798 James Malton painted a watercolour called *'The Two Sisters near Margate*', the title reflecting the twin towers of the church (**Fig. CS3.1.6.**). Later, in 1813, the Reverend J. Skinner recorded the wall of the Roman fort of Reculver in his diary. The wall used to be located seaward of the church, and was long since lost to coastal erosion. The drawing by Reverend Skinner illustrated the drastic undercutting of the cliff as a result of coastal erosion (**Fig. CS3.1.8.**). Later Charles Lyell, the celebrated geologist, cited the Roman shore fort of Regulbium (Reculver) as evidence of the scale and pace of coastal erosion (Lyell, 1838[1]). Lyell's own view of 1834 shows the significant retreat of the coastline since an earlier engraving made in 1781 (**Fig. CS3.1.4. & CS3.1.5. overleaf**).

William Daniell, on his *'Voyage round Great Britain'*, passed along the Kent coast in 1824, and he noted that *"this important landmark is also known by the name of the Sister Churches, assigned to it in reference to the two spires which crown the towers on the west front of the church. The following inscription, copied from a stone tablet over the door of the edifice, will serve to explain their present condition: these towers, the remains of the once venerable church of the Reculvers, were purchased for the Parish by the corporation of the Trinity House of Deptford Strand in the year 1810, and the groynes laid down at their expense to protect the cliff on which the church had stood. When the ancient spires were afterwards blown down, the present structures were erected, to render the towers still sufficiently conspicuous to be useful in navigation"* (Captain Joseph Cotton, Deputy Master in the year 1819). Daniell continued *"the abrupt bank of earth on which the church stands has been much wasted by the sea... to break the impetus of the tide, and prevent further encroachments, the Trinity House have laid down groynes on the beach, which it is hoped will be sufficient for the security of so valuable a land mark as her sister churches"*.

Daniell continued *"at this station, denominated regulbium by the Romans... their ancient lease to the castle, which defended the northern entrance of the Roman haven. The church is dedicated to St Mary, and is supposed to have been built on the foundations of one which belonged to a Benedictine abbey erected here by Bassa, a Saxon priest and noble, in the reign of King Egbert"* (Daniell & Ayton, 1814-25[2]).

Reculver once occupied a strategic location of the north-western end of the Wantsum Channel between the Isle of Thanet and the Kent mainland. This led the Romans to build a small fort there at the time of their conquest in Britain in 43 AD. After the Romans left Britain in the early fifth century, Reculver became a land estate of the Anglo-Saxon kings of Kent. The site of the Roman fort was given over to the establishment of a monastery dedicated to St Mary in 669 AD, and King Eadbhert the Second of Kent was buried there in the 1760s. The twin spires of the church became a landmark for mariners known as 'The Twin Sisters' supposedly after daughters of Geoffrey St Clare. The population of Reculver declined as the Wantsum Channel silted up, and coastal erosion claimed many buildings constructed on the soft sandy cliffs. The village was largely abandoned in the late eighteenth century, and most of the church was demolished in the early nineteenth century. Protecting the ruins and the rest of Reculver from erosion has been an on-going challenge for the coast protection authority.

After Daniell's view of Reculver the next artwork in chronological succession was a painting by James Ward of 1818 entitled '*Reculver Church*', which shows a view of the building dramatically located on the cliff edge taken from the west looking eastwards, whilst a further view by Stuart Westmacott, painted in 1851, shows the building from the east side looking west.

This sequence of images of the Reculver Church frontage tells the story of coastal change over the last 1,000 years, and without these images it would be less easy to appreciate the dramatic rate of coastal change that has taken place. Along most coastal frontages erosion is episodic rather than uniform, in other words significant retreat takes place after particular storm events or wet periods when the cliffs become saturated and liable to instability problems. There may be long periods where cliffs appear relatively stable but, over a time span of 100 years, the overall rate of retreat can be very significant.

Images of this kind can be useful when explaining to stakeholders about long-term coastal change and how their particular frontage may be affected if natural processes continue in the event of an increase in the rate of erosion as a result of climate change.

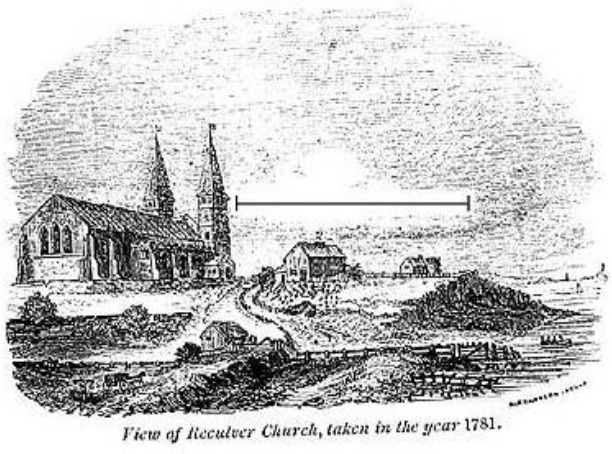


Fig. CS3.1.4. Charles Lyell cited the Roman shore fort of Regulbium (i.e. Reculver) as evidence of the scale and rate of marine erosion. In this view of 1781 Lyell observed that there had been a notable distance between the church and cliffline.

Fig. CS3.1.5. Lyell's view of 1834 shows the significant retreat of the shoreline since the previous engraving (left) was made in 1781.

Fig. CS3.1.6. *'The Reculver'*, commonly called *'The Two Sisters'* by James Malton, 1798. Malton's watercolour drawing shows a building existing between the seaward side of the church and the cliff edge. Image courtesy of Bonham's. Private collection.
Fig. CS3.1.7. (mid-left) shows the view today.

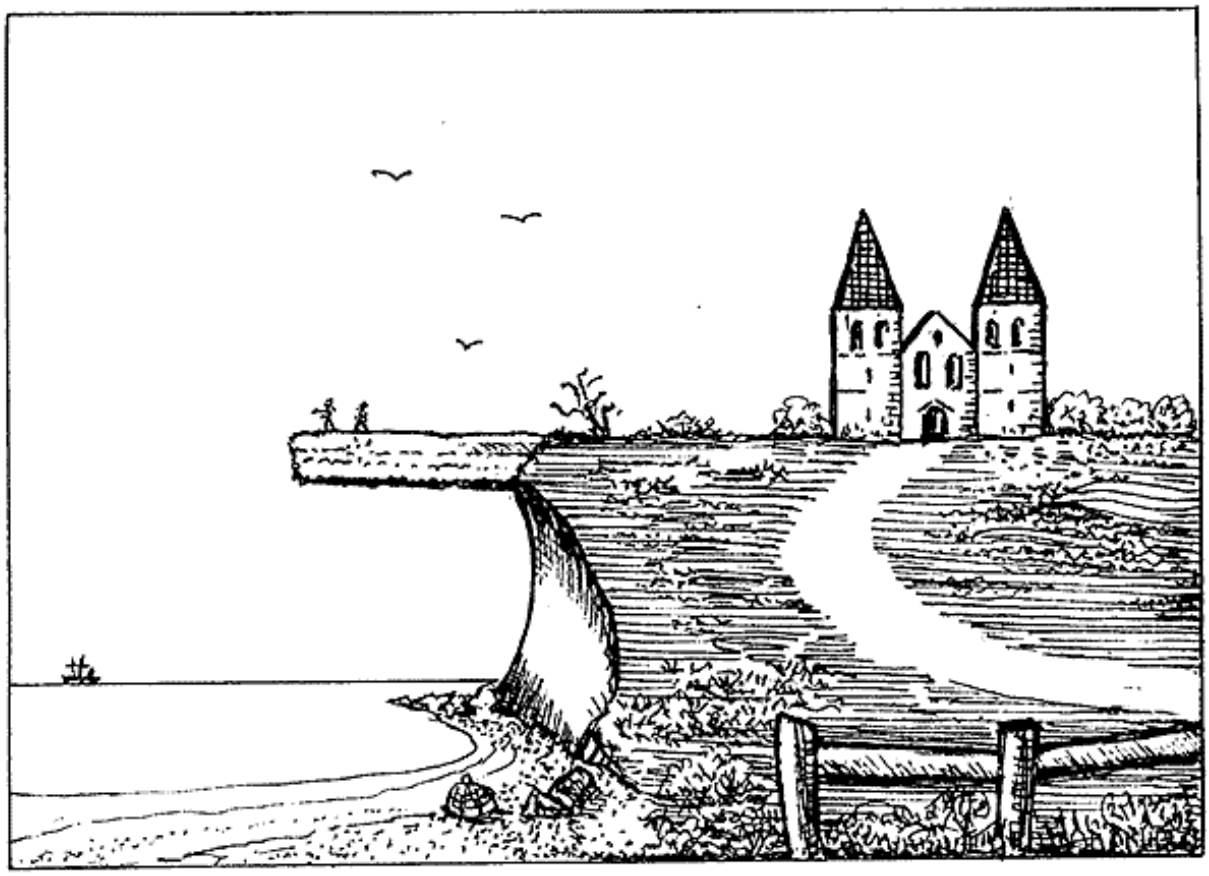


Fig. CS3.1.8. The Rev. J. Skinner recorded the wall of the Roman fort at Reculver in his diary around 1813 after the cliff had been drastically undercut by erosion. This diagrammatic drawing provides a simplistic summary of the erosion issue as he perceived it.

Fig. CS3.1.9. In this view of Reculver by James Ward painted in 1818 a range of coastal defences can be seen at the foot of the soft cliffline. Image courtesy of Canterbury City Council Museums and Galleries.

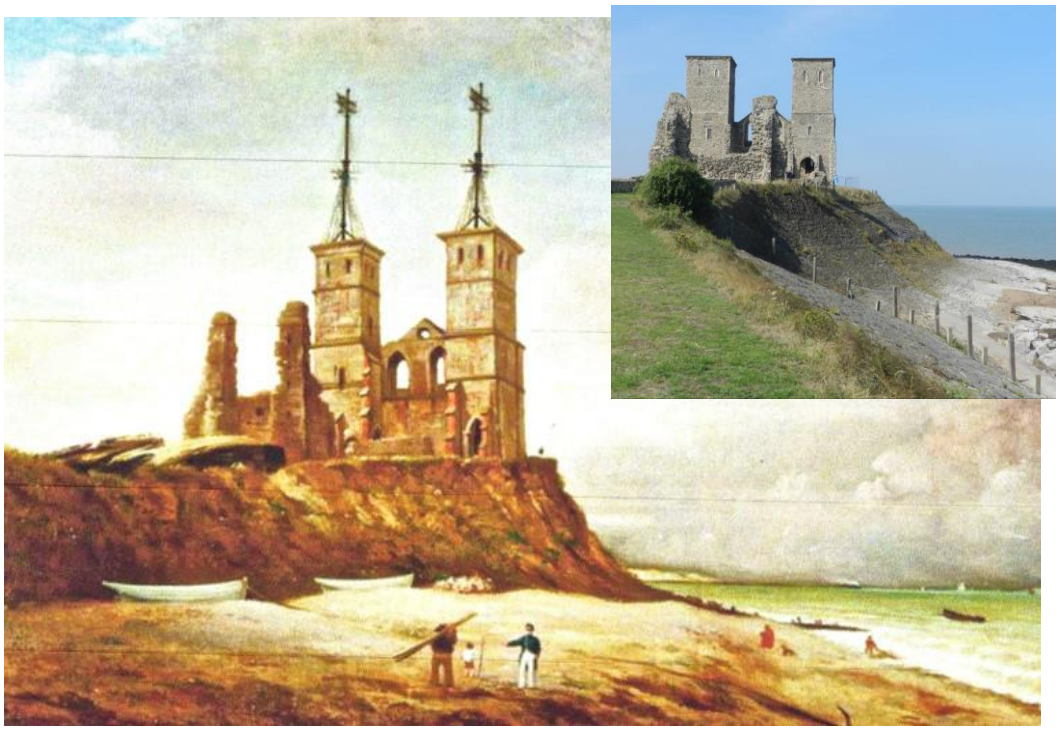


Fig. CS3.1.10. A further view of Reculver Church from the east side by Stewart Westmacott painted in 1851. Image courtesy of Canterbury City Council Museums and Galleries. The view looking east today is at **Fig. CS3.1.11. (top right).**

Fig. CS3.1.12. *'Reculver'* by Alfred Robert Quinton; a watercolour painted c.1925. Image courtesy of Salmon's.

5. Key issues that can be learnt from this site.

The case study of Reculver is a particular interest because of the chronology of illustrations dating back to the early nineteenth century, which show the gradual impact of coastal erosion on the Roman fortification and other buildings in the vicinity. Williams Daniell's view of Reculver shows the waves attacking the soft cliffline immediately adjacent to the church, and other watercolours show how attempts were made in the past to slow down the rate of attack along the frontage.

6. References

1. Lyell, C., 1838. *'The Elements of Geology'.* John Murray. London.
2. Daniell, W. & Ayton, R., 1814-25. *'A Voyage Round Great Britain'*. Longman & Co. London.

Case Study 3.1.2 – Margate, North Kent

1. Location

Margate is a popular seaside resort located on the north coast of Kent between the resorts of Westgate-on-Sea to the west and Foreness Point and North Foreland to the east.

2. Why was the Case Study Site selected?

This site was selected to illustrate the role that historical artworks can play not just in informing us of long-term coastal change but also physical and structural change to the coastline, as a result of human intervention.

3. Summary of the Geology, Geomorphology & Coastal Processes

Margate is located on the Isle of Thanet in the north-eastern corner of the County of Kent. It was developed along the chalk cliffline, which dominates the frontage and which is recognised as being of international importance on account of the geology, environment and landscape character. To the west of the town, the wave cut chalk shore platforms at the base of the cliff are of particular geological significance, whilst, in the town itself, the frontage has been heavily developed and defended with coast protection and harbour structures. Because of the extent of the development the beach at Margate is dependent on management including the use of groynes and nourishment where appropriate. The coast protection structures, including groynes and the harbour arm, restrict sediment movement along the frontage.

The town of Margate is of particular significance in terms of its residential, commercial and strategic activities, particularly tourism. As a result, coastal defences will continue to be maintained and upgraded where deemed necessary to protect these valuable assets.

4. How can the art imagery resources inform us of changes that have affected this coastal zone?

The view of Margate harbour (**Fig. CS3.1.13.** overleaf) and engraved by William Daniell in 1823, illustrates the growing resort taken from a vantage point just to the west of the harbour arm. An advantage of Daniell's work was his architectural and geographical accuracy including the form of the small beach in the foreground, the shape of the harbour arm, showing its proximity to the seawall and seafront properties, and the view looking along the coastline in an easterly direction beyond. Works of art, which depict seawalls and harbours can be particularly useful to designers who are having to replace or improve these structures. Often the original harbour structure may have been covered by concrete or other later additions and alterations. It is, therefore, useful to understand the nature of the original construction, which could help reduce costly investigations and studies that might otherwise be deemed necessary. This view is typical of the meticulous observation and eye for detail in William Daniell's aquatint engravings.

5. Key issues that can be learnt from this site.

This view by Daniell was selected to illustrate the role that art can fulfil in terms of understanding not just physical changes on the coast but also the history of coastal development and construction. Not only are features such as harbour arms influential in terms of interruption of sediment transport but an understanding of their form can be particularly helpful to designers and coastal engineers who may wish to repair or replace these structures. It can be seen from Daniell's view and from the present day view that the harbour wall has stood the test of time and remains unaltered. Part of the former beach is now occupied by a dinghy park and the Turner Contemporary Art Gallery can be seen on the left. It can be seen that artwork such as this can inform not just coastal risk management but integrated coastal zone management more widely as the view encompasses a range of features and issues relating to the coastal zone.

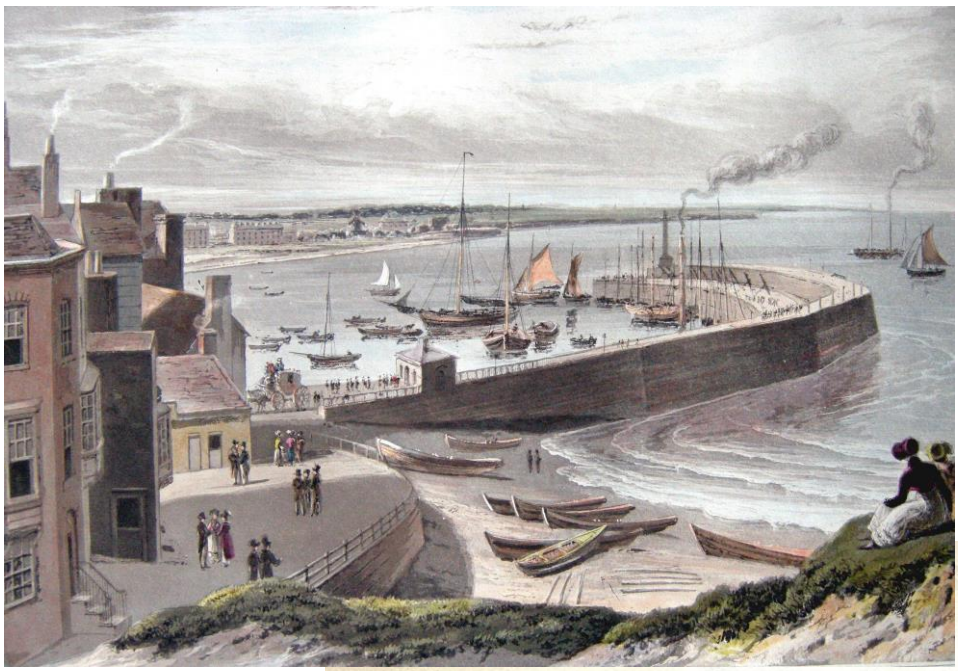


Fig. CS3.1.13. (top) *'Margate'* by William Daniell engraved in 1823. His view illustrates how artworks can depict how just physical change but also the history of coastal development and sometimes the modes of construction used.

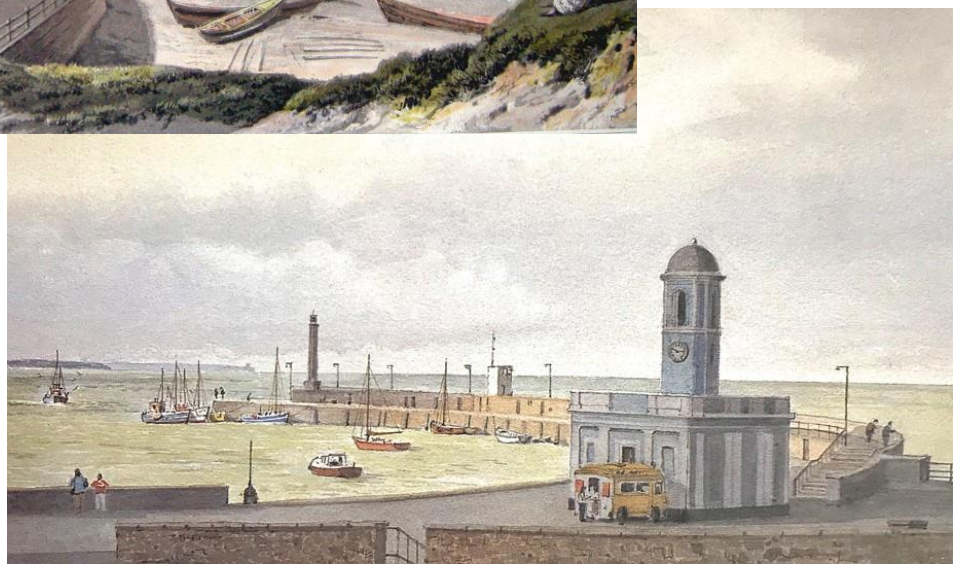


Fig. CS3.1.14. (middle) This view of the harbour at Margate was painted by David Addey in 1988. Courtesy of David Addey.

Fig. CS3.1.15. (below) shows the present day view.

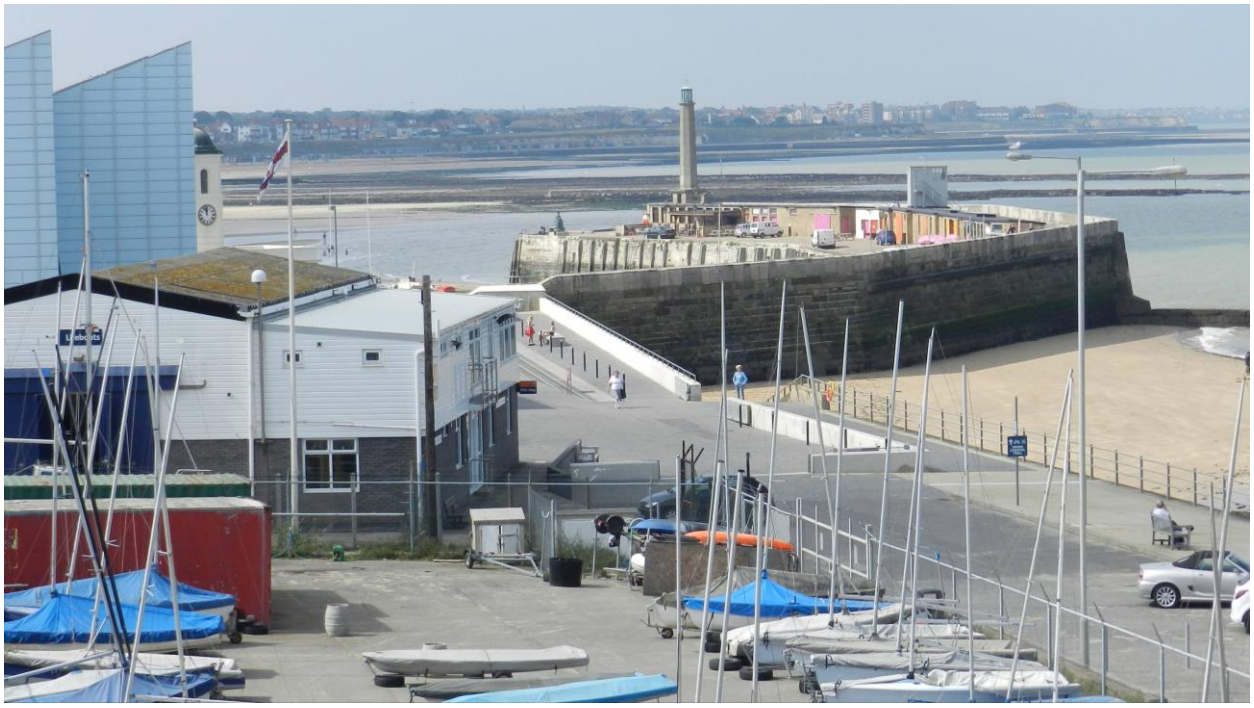


Fig. CS3.1.16. *'Westcliff Promenade, Ramsgate'*. English School. Watercolour.
Image courtesy of the Maas Gallery.

Case Study 3.1.3 – Pegwell Bay, Kent

1. Location

Pegwell Bay is located on the East Kent coast to the south and west of the seaside town of Ramsgate. The town faces south looking along the Kent coast, past Sandwich and Deal, in the direction of Dover and out across the Straits of Dover.

2. Why was the Case Study Site selected?

Pegwell Bay is famous in terms of art history for the painting by William Dyce RA (1806-1864) entitled *'Pegwell Bay – Recollections of the 5th October 1858'*. Dyce was an artist of the Pre-Raphaelite Brotherhood who wished to capture nature in every detail and as precisely as possible. The painting is remarkable for its almost 'photographic' quality, and proved fascinating to Victorians at the time on account of the emerging science of geology but also the conflicts it posed in relation to the biblical account of the Creation. The study site shows a chalk cliff frontage affected by coastal erosion and weathering, together with a detailed portrayal of the foreshore, which bears comparison with the present day situation.

3. Summary of the Geology, Geomorphology & Coastal Processes

Pegwell Bay is located at the southern end of the chalk cliffline to the west of the town of Ramsgate, and north of the Minster Marshes and Ash Level, which form the floodplain of the River Stour; the river flows northwards from Sandwich to emerge into Pegwell Bay. The Bay is backed by a rugged well-jointed chalk cliff with a wave-cut platform and a rocky foreshore, whereas to the south there are extensive sand dunes and a shingle foreshore forming part of the Sandwich Bay Nature Reserve. Within the floodplain of the Stour there are extensive saltmarshes with a hinterland of dunes.

Pegwell Bay lies to the west of the main developed area of Ramsgate but an important strategic road links Ramsgate with the community of Cliffs End to the west. Existing coastal defences are being maintained and may require upgrading in the future; the cliff top is susceptible to weathering and cliff falls. To the west of the Bay at Cliffs End, the steep chalk cliffs give way to relic, undefended sandstone cliffs before the transition from the Isle of Thanet to the predominantly low-lying East Kent coast to the south.

4. How can the art imagery resources inform us of changes that have affected this coastal zone?

The oil painting by William Dyce is of particular interest on account of the extraordinary detail that has been achieved. In terms of the cliffline the structure of the cliffs, including the jointing, is particularly well defined, as are the details of the caves running along the foot of the cliff. Along the foreshore one can see the wave-cut platform, which extends into the inter-tidal zone, and, in the foreground, details of a groyne forming a rudimentary coast protection structure. At the time the view was painted by Dyce it coincided with the emerging art of photography and many people thought this painting had been copied from a photograph, which was incorrect. However, it demonstrates the almost photographic quality that could be achieved through art by the followers of the Pre-Raphaelite ethos of capturing nature in its precise detail.

5. Key issues that can be learnt from this site.

Paintings of this kind can inform coastal risk management by providing a reliable comparison with the conditions to be found in later works of art, in photographs and when viewed at the present day. From the same spot estimates could be made of cliff retreat because it is possible to identify sections of cliff that may have fallen away as a result of undercutting of the toe of the cliff by the sea, and weathering over the last 160 years. It can, therefore, advise coastal engineers of the rate and scale of coastal change over a very long time span.

The oil painting of Pegwell Bay by William Dyce provides an excellent example of how artists of the Pre-Raphaelite Brotherhood and their Followers could depict the coast in a truthful and highly accurate manner. The portrayal of the chalk cliffline, the sea caves and the eroding beach is almost photographic,

Fig. CS3.1.17. *'Pegwell Bay – Recollections of 5th October 1858'* by William Dyce, RA demonstrates the precise detail that could be achieved by the Pre-Raphaelite artists. Dyce has achieved a depiction that has the appearance of a photograph.

Courtesy of © Tate Images 2018.

Fig. CS3.1.18. (below) shows the chalk cliff frontage today.

and allows comparisons to be made immediately with present day photographs. Whilst, generally, artworks may provide a qualitative tool in support of the understanding of coastal change for certain artists such as Dyce, Edward William Cooke RA and others, it may be possible to make quantitative assessments of change on account of their accuracy. If such an approach can be investigated it will allow an understanding to be made of the rate of physical change in a very beneficial way, because it would provide data extending back far beyond traditional methods of appraising the rate of cliff retreat for example (see Chapter 5 analysis below).

Fig. CS3.1.19. *'No Man's Land, Margate'* by William Parrott painted in oils in 1869 provides a detailed depiction of the historic buildings lining the clifftop.

Image courtesy of Christie's Images © 1997.

Case Study 3.1.4 – Deal Castle, East Kent

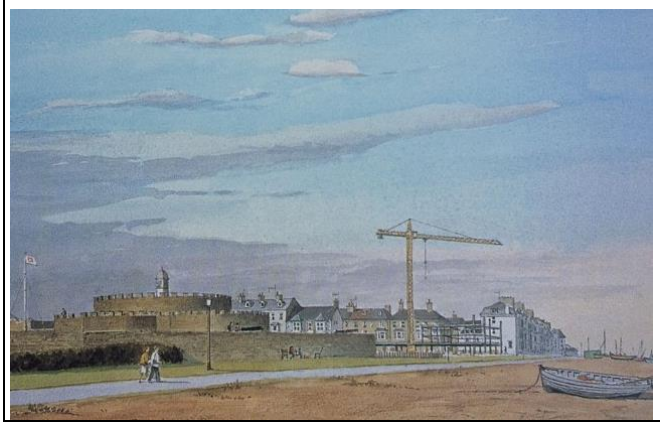
1. Location

Deal Castle is located on the East Kent coast along the Deal town frontage, and is situated immediately behind the beach.

2. Why was the Case Study Site selected?

Deal Castle was chosen as a study site because it is located adjacent to the low-lying coast and an aquatint engraving by William Daniell RA was available, which provides precise details of the structure in the year 1823 (Daniell & Ayton, 1814-25[1]).

Fig. CS3.1.20. *'Deal Castle'* by William Daniell RA, engraved in 1823. His fine draughtsmanship shows us the relationship between the structure and the shore at that time. David Addey's watercolour as **Fig. CS3.1.21.** (1988) shows the castle adjacent to the beach, whilst **Fig. CS3.1.22.** depicts the scene thirty years later. A substantial beach now provides flood defence for this low-lying coastline.



3. Summary of the Geology, Geomorphology & Coastal Processes

The town of Deal lies on the open coast with a mixed shingle and sand beach to the north and shingle beaches along this frontage, which is defended. The area to the north of Deal is low-lying, whereas to the south of the town the land begins to rise to meet the cliffs at St Margaret's Bay and South Foreland.

To the north, the frontage consists of shingle beaches backed by an embankment of shale and a narrow dune system; both the beach and dunes are of international environmental importance. Along the coastline of the Deal frontage assets are protected by a shingle beach with timber groynes and a concrete seawall; flood defences also provide protection for a large area of the town. The coastal risk management policy is to seek an improvement to reduce erosion and flood risk, through beach management, by increasing the volume of the shingle beach. South of Deal Castle there are no formal defences and the intention is to carry out minimal work and maintain the beach; it is unlikely that any properties will be at risk if this approach is adopted.

4. How can the art imagery resources inform us of changes that have affected this coastal zone?

This view of Deal Castle from the south was produced in 1823. It shows the fortification constructed directly on the beach. The castle had been built by King Henry VIII in 1540, in the shape of a Tudor Rose, and aimed to provide a powerful deterrent from attacks by the French.

This view of Deal Castle by William Daniell provides a very precise depiction of the location of this important heritage structure on the beach at Deal. Beach levels can be compared with later images and photographs over time to assist the understanding of coastal change along this part of the open East Kent coast. The coastline has since been defended with a concrete seawall approximately 20m seaward of the foremost element of the castle defences.

5. Key issues that can be learnt from this site.

At the time of William Daniell's visit in 1823, Deal Castle belonged to the government, but was of lesser importance because of the establishment of peace with France. The castle was depicted in detail by Daniell, who was a very accomplished architectural draughtsman, and he clearly shows the proximity of the structure to the steeply sloping beach. Compared to the watercolour produced by David Addey in 1988, it can be seen that a significant portion of the original castle buildings have been removed, this included the Tudor Rose layout of the fortifications that had been constructed during the reign of King Henry VIII in 1540. Further damage was incurred following a direct hit in the Second World War. The castle is now protected by a substantial beach.

6. References

1. Daniell, W. & Ayton., 1814-1825. *'A Voyage Round Great Britain'*. Longman & Co. London.

2. South-East Coastal Group, 2008. *'Isle of Grain to South Foreland SMP2'*.

Case Study 3.1.5 – Walmer Castle, Kent

1. Location

Walmer Castle is located on the East Kent coast at the southern end of the Deal town frontage, and is situated immediately behind the beach.

2. Why was the Case Study Site selected?

Walmer Castle was chosen as a study site because it is contiguous with Deal Castle and is located adjacent to the low-lying coast. An aquatint engraving also by Daniell was available, which provides details of the Castle structure and its relationship to the beach in the year 1824.

3. Summary of the Geology, Geomorphology & Coastal Processes

The town of Deal lies on the open coast, with a mixed shingle and sand beach to the north and shingle beaches along the frontage, which is defended. The area to the north of Deal is low-lying, whereas to the south of the town the land begins to rise to meet the cliffs at St Margaret's Bay and South Foreland.

To the north, the frontage consists of shingle beaches backed by an embankment of shale and a narrow dune system. The beach and dunes are of international environmental importance. Along the coastline of the Deal frontage assets are protected by a shingle beach with timber groynes and a concrete seawall; flood defences also provide protection for a large area of the town. The coastal risk management policy is to seek an improvement to reduce erosion and flood risk, through beach management, by increasing the volume of the shingle beach. There is also the possibility of improving the seawall along the Deal frontage to reduce the risk of overtopping. South of Deal there are no formal defences and the intention is to carry out minimal work and maintain the beach; it is unlikely that any properties will be at risk if this approach is adopted.

4. How can the art imagery resources inform us of changes that have affected this coastal zone?

This view shows the southernmost of three castles (the others are at Deal and Sandown) built in the 1530s by King Henry VIII. In the view by William Daniell (1823) the castle appears situated immediately above the beach. The beach appears to have taken on a barrel form with a crest, along which people can be seen walking, whereas behind shallow lagoons of water indicate where the sea has flooded through the barrier beach. A low wall appears to protect the foot of the slope below the castle from coastal erosion. The view describes, in a very precise way, the morphology of this part of the coastline, in particular the form of the cliffline and the extensive beach, looking northwards towards Deal.

5. Key issues that can be learnt from this site.

The coloured aquatint engraving illustrates coastal conditions in the early nineteenth century and contrasts significantly with the present day situation where the beach appears much more stable, with the upper beach being vegetated. Whereas, in the view by Daniell, the Castle appears vulnerable to erosion and demanded the provision of a seawall, the present structure appears much more secure. The frontage could become increasingly vulnerable in the future as a result of coastal erosion promoted by rising sea levels, and so it is likely that the defences will be maintained for the foreseeable future, but may require replacement in the long term.

Fig. CS3.1.23. In his view of 'Walmer Castle' (1823) Daniell provides us with an extensive and detailed depiction of the shoreline and cliffs. The form of the beach at low water can be seen clearly. Some defences have been put in place around the frontage of the castle, which forms a hard point along this relatively soft coastline.

Fig. CS3.1.24. An oil painting by Henry Pether (c.1852) shows how the castle frontage has been extended seawards to create a lawn and a coastal path. Image courtesy of Woolley & Wallis, Salisbury.

Case Study 3.2 – Hastings

1. Location

The case study site extends for a distance of approximately 2km along the Hastings resort frontage and east past the fishing village.

2. Why was the Case Study Site selected?

This site was selected in order to examine how art can reflect beach conditions over time. Hastings beach and the activities of the fishermen on the shore were a magnet for Victorian and Edwardian artists, and as a result there are numerous views of this location. The case study also includes views of the cliffs behind the fishing quarter at the eastern end of the frontage and reviews the depiction of the unstable nature of the sandstone cliffs.

3. Summary of the Geology, Geomorphology & Coastal Processes

As well as considering the impact of erosion and historical sea level rise on Hastings amenity beach the study area included a weak sandstone cliffline at the eastern end of the town. The cliffs are composed of sandstones, which are susceptible to the processes of weathering, and erosion at their toe by the sea along the undefended sections. The jointing in the cliffs means that sections are prone to breaking away in massive blocks and causing toppling failures. Once the material falls onto the beach, it is quickly removed by the sea, enabling the cycle of events to initiate once again. Ground water, soaking through the permeable cliffline and emerging at different points through the cliff face, is also an important process which speeds up the instability problems.

Where the main Hastings frontage is defended, rising sea levels and a possible increase in more unsettled weather patterns could lead to increasing beach draw-down, changing its morphology in future years. This is likely to necessitate further coast protection measures in order to maintain the beach in the future. The sandstone cliffs will be allowed to continue to weather and erode except where there is economic justification for protection of property and assets. Along the Hastings town frontage, the value of assets currently being protected by the existing seawall and beach is substantial. The policy is to continue to maintain and upgrade defences where necessary, looking ahead for the next 100 years.

4. How can the art imagery resources inform us of changes that have affected this coastal zone?

Nine views have been selected to illustrate different aspects of coastal change along this frontage. These relate particularly to beach conditions but three views also illustrate the nature of the cliffline and the wider geomorphological setting. Finally, an interesting painting by Charles A. Graves, dated 1901 shows the remains of the Elizabethan harbour projecting from amongst the rocks on the lower foreshore. Artworks containing information on historical structures such as this can help build up a picture of the changing coast over the centuries and, with other archaeological data, can support our understanding of past coastal developments.

A lithograph by an artist of the English School, c.1850 (**Fig. CS3.2.10.**) shows the fishing village located at the eastern end of the main beach. The view is interesting in that it shows the extent of the beach at the time, and also the cliffline displaying the well-jointed sandstone. **Fig. CS3.2.5., CS3.2.6. & CS3.2.9.** provide views taken from the lower beach, looking eastwards along the frontage. They were painted by the prolific local artist William Henry Borrow in 1885 and 1879 respectively. They show the extensive beach at the time and also the steepening of the beach in the inter-tidal zone; a feature that exists at the eastern end of the beach today.

Fig. CS3.2.12. a further oil by Borrow, is taken from the cliff to the east of Hastings and looks westwards along the coastal frontage, with Hastings Pier in the middle distance. This view is taken at high water, and it shows the sea touching the promenade. In the foreground the cliffs are well depicted, showing the jointing and bedding planes. The weathered surface on the top of the cliff, partly vegetated, can also be seen.

5. Key issues that can be learnt from this site.

The lithograph of the eastern end of Hastings beach, **Fig. CS3.2.10.** shows the extent of the beach in the mid-nineteenth century. It has been increasingly recognised that it is necessary to take a long-term perspective when looking at coastal issues and to understand the processes of coastal evolution over time. By making decisions about coastal risk management policy, looking ahead for the next 100 years, it is important to understand the rate and scale of change over time, and images of this kind can help explain beach conditions in the past.

The collection of views by Borrow of Hastings beach will be of interest to coastal engineers wishing to understand how the frontage may have changed over time. This and other works held in the Hastings museum illustrate the form of the beach over a 150 year period. It has been explained that the beach may become under increasing pressure as a result of rising sea levels and 'squeeze' over the next 20-50 years, and an examination of such historical images can allow the changes to the beach over time to be plotted and better understood.

The painting by Graves of the Elizabethan harbour (**Fig. CS3.2.9.**) is one of many examples of coastal landscape paintings, which include archaeological and maritime heritage evidence. Such images can provide evidence alongside archaeological fieldwork to help understand past coastal developments and activities around the English coast.

Fig. CS3.2.1. *'Map of Sussex'* by Thomas Moule. 1830. Showing location of Hastings case study site.

Fig. CS3.2.2. This extensive view of Hastings by William Daniell RA in 1823 looks westwards towards the town frontage and shows the fishing fleet on the shore below the line of rugged sandstone cliffs. The image by David Addey (**Fig. CS3.2.3. below**), who visited Daniell's vantage point in 1989, shows the extensive tourism development, although some of the original architecture remains, as does the character of the fishing village (The Stade) just below Daniell's vantage point.

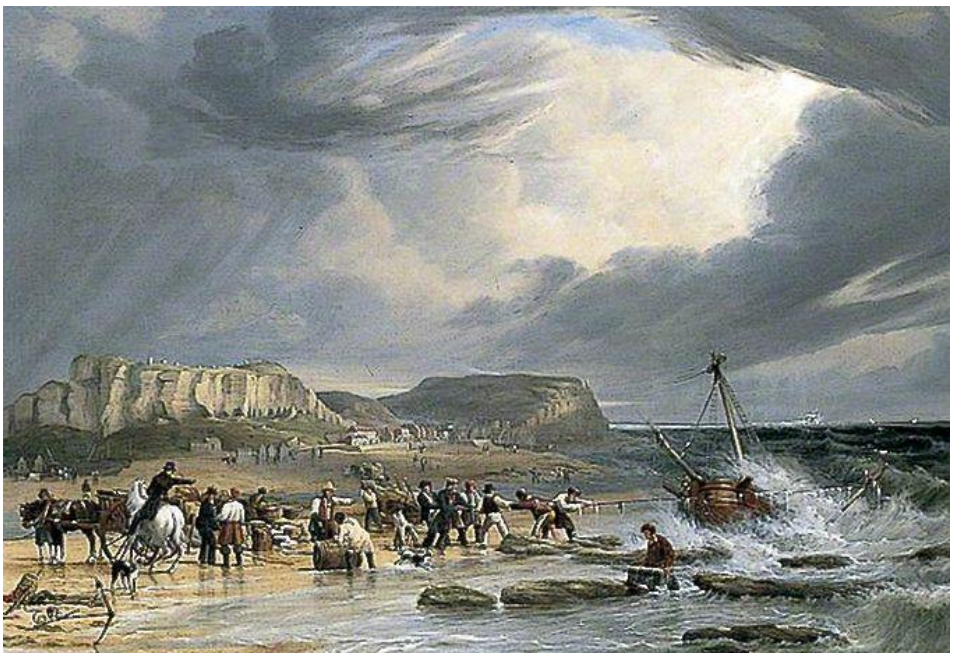


Fig. CS3.2.4. *'Rescue at Hastings'* by William George Moss, 1814. This oil painting shows the Hastings frontage from Low Water Mark, looking east along the extensive beach towards the town, and the high sandstone cliffline beyond.

Image courtesy of Hastings Museum and Art Gallery.

Fig. CS3.2.5. An oil by the prolific Hastings artist, William Henry Borrow, dated 1885. The relatively gentle sloping foreshore can be observed. Hastings Castle is on the top of the cliffs overlooking the expanding seaside resort.

Image courtesy of Hastings Museum and Art Gallery.

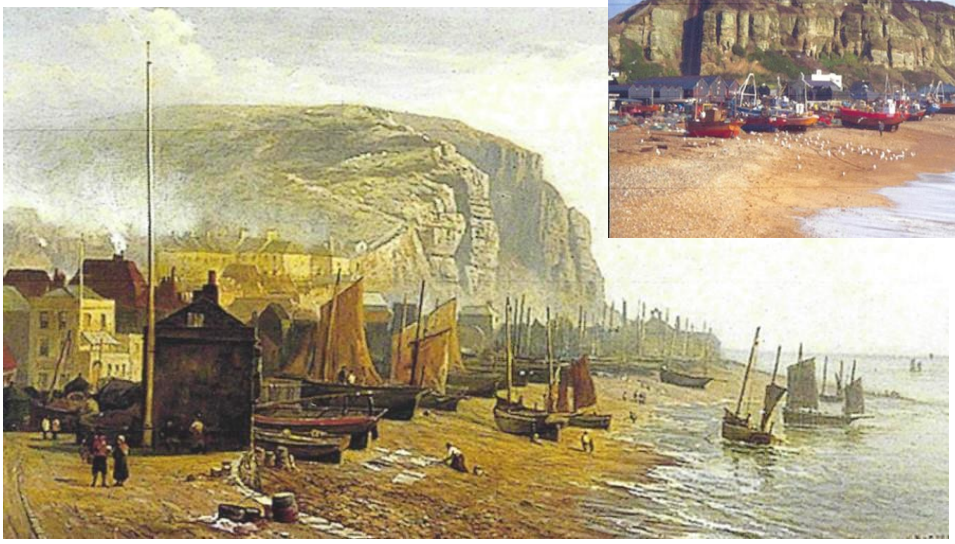


Fig. CS3.2.6. A further oil by W. H. Borrow, dated 1879, showing the steeper beach at the eastern end of the Hastings frontage; this is also reflected in the present day view (**Fig. CS3.2.7.**).

Image courtesy of Hastings Museum and Art Gallery.

Fig. CS3.2.8. An oil by Edwin Hayes entitled *'Old Hastings'*, 1880, taken from Low Water Mark, showing the considerable expanse of beach at that time.

Image courtesy of Hastings Museum and Art Gallery.

Fig. CS3.2.9. *'Remains of the Elizabethan Harbour at Hastings'* by Charles A. Graves, 1901. This view shows the timber relics of the harbour. Beyond is the fishing village and behind it the jointing and mechanisms of failure of the rugged sandstone cliffs are particularly well painted.

Image courtesy of Hastings Museum and Art Gallery.

Fig. CS3.2.10. This mid-nineteenth century lithograph provides a detailed view of the character of the fishing village at the eastern end of the Hastings town frontage.

Fig. CS3.2.11. A detailed watercolour of the eastern end of Hastings beach in about 1920 by the prolific coastal artist, Alfred Robert Quinton. The boats are beached at the waterline below a change in the profile of the shore, which is still present today. The control room for the lift is visible on the cliffs behind.

Image courtesy of Salmon's Limited.

Fig. CS3.2.12. A panoramic view by W. H. Borrow from the top of the cliffs looking westwards in 1881. The geology is carefully painted and shows the dipping, jointed strata. The scene is painted at High Water as the sea abuts the promenade.

Image courtesy of Hastings Museum and Art Gallery.

Case Study 4 – Central Southern England

4.1. Introduction

The two selected study sites lie within the Hampshire Basin, at Portsmouth in Hampshire, and at Ventnor Undercliff on the Isle of Wight. The Hampshire coastline extends for a distance of approximately 30m (48km) along the central south coast of England and abuts the Solent; the Isle of Wight coastline extends to a total of 65m (110km). The study site is at Portsdown Hill overlooking Portsmouth Harbour and along the 7m (12km) Undercliff on the south coast of the Isle of Wight. The particular geomorphological interest of the Solent and Isle of Wight study sites relate to understanding of coastal processes and instability problems.

The study area coastlines have a complex geological and geomorphological history with, as a result, a wide variety of landscape types. Although parts of the coastline are heavily developed, for example the great maritime port of Portsmouth, together with the town of Ventnor and adjacent villages along the south coast of the Isle of Wight, much of the coastline is undeveloped and has been designated for its outstanding landscape, environmental and geological importance. The Hampshire and Isle of Wight coastlines were visited and painted by numerous artists since the late eighteenth century, as well as being described in many illustrated topographical books. For this reason, and on account of the range of physical and environmental conditions available for examination around the coast they form ideal case study locations.

4.1.1. Geology & Geomorphology

The coastlines of Hampshire and of the Isle of Wight lie within the Hampshire-Dieppe Basin; its geological structure arising from the Miocene Alpine mountain-building phase that took place approximately 30 million years ago. The rocks on the Isle of Wight were uplifted, folded and compressed, and subsequently eroded and weathered. As a result of these structural movements, some of the strata now rest in a near vertical position, meaning that a wide variety of rock types, dating from the Cretaceous Period to Recent, are exposed around its coastline.

The steepest arm of the Isle of Wight monoclinal fold dips almost vertically to form the Central Downs, which cross the Island from west to east; north of this the rocks dip more gently towards the Solent. The southern limb of the monoclinal fold dips gently from the Central Downs towards the south coast behind the town of Ventnor. As a result of the mountain-building phase, and subsequent changes in sea level over the last 10,000 years, parts of the Isle of Wight coast are particularly susceptible to coastal instability problems promoted by erosion, geological conditions and high ground water levels.

Although the Hampshire Basin and the Isle of Wight were not glaciated, they formed a tundra landscape. As the ice gradually melted, unlocking huge volumes of melt waters, the Hampshire Basin formed a natural drainage channel, which flowed eastwards along the line of the present day Solent, with flows entering the former Solent River from both Hampshire and the Isle of Wight.

4.1.2. Coastal Processes

The coastlines of Hampshire and the Isle of Wight, facing the English Channel, are impacted upon by Atlantic storm waves from the south-west, as well as waves generated within the Channel itself and, indeed, within the Solent. This coastline has, historically, experienced rapid rates of coastal erosion resulting in instability problems, breaching and sea flooding. The coastline supports a high population

density, with major cities, towns and smaller settlements, as well as important infrastructure located in vulnerable locations.

Climate change induced coastal change, including sea level rise, will be likely to promote worsening conditions, particularly more rapid rates of coastal erosion and the reactivation of coastal landsliding, as well as increased flooding by the sea over the next decades. The low-lying coastlines of Hampshire are particularly vulnerable to flooding, for example the city of Portsmouth, which is densely populated, as well as the towns of Cowes and Yarmouth on the north coast of the Isle of Wight. Elsewhere, rising sea levels are inundating important salt marsh and mudflat habitats, which also form natural coastal defence for the creeks and estuaries bordering the Solent. On the open coastline along the south of the Isle of Wight rapid rates of erosion are being experienced, and these are expected to continue and increase, whilst, along the south coast of the Isle of Wight, the Undercliff, which is north-western Europe's largest coastal landslide complex, can be expected to face increasing challenges as a result of both coastal erosion and increased ground water levels as a result of changing weather patterns.

To address these issues shoreline management plans have been prepared for the whole of the study area coastlines, and an effective coastal monitoring programme has been in place for over ten years. Good communication between adjacent coast protection authorities, local authority planning departments, and other stakeholders is achieved through the *Standing Conference on Problems Associated with the Coastline* (SCOPAC), a coastal network, the Solent Forum and the Southern Coastal Group. The Eastern Solent Coastal Partnership is the body responsible for delivering a major programme of defences along the Portsmouth and Southsea frontages (East Solent Coastal Partnership[1]).

4.1.3. The Coastal Environment

The processes of mountain building, erosion and weathering over geological time, have resulted in a spectacular range of textbook coastal landforms on both the Isle of Wight and the Hampshire coastlines. The environmental quality of the study sites has led to the designation of a substantial proportion of these coasts for landscape, nature and earth science conservation reasons, making the Isle of Wight one of the most environmentally designated coasts in Europe. The Portsmouth study site lies within the 'South Coast Plain', which is a flat, coastal landscape with an indented shoreline lying between the South Downs of Hampshire and the waters of the Solent. The Portsmouth Harbour coastline is a distinctive local landscape with inter-tidal habitats of international importance for their wildlife (Natural England, 2014[2]). The study site, when viewed from Portsdown Hill looking southwards, offers remarkable vistas over the low-lying coast to the Solent and the north-east coastline of the Isle of Wight beyond.

4.1.4. Coastal Heritage

The two central southern England case study sites of Portsmouth and the Isle of Wight Undercliff contain a rich coastal heritage. The city of Portsmouth itself has been a defended town since medieval times, and was the most important naval base and home of the Royal Dockyard, being founded by King Henry VIII in 1540. In the vicinity of the historic dockyard and Old Portsmouth there are many buildings that relate to the history of the Royal Navy. One of Europe's finest Roman fortresses, Porchester Castle, forms a prominent landmark on the northern edge of Portsmouth Harbour. On the chalk downs behind the harbour at Portsdown Hill, Fort Nelson is one of a number of fortifications built by Lord Palmerston in the 1860s to defend the Solent and Portsmouth from naval attack, alongside the Solent forts and others around the coastline of the Isle of Wight. The Isle of Wight study area is Ventnor Undercliff, which extends along the southern coast for a distance of 12km, from Luccombe in the east to Blackgang in the west. Although there are a small number of earlier buildings, Ventnor and the surrounding villages are essentially Victorian and there are many fine examples of Victorian residences and smaller marine villas, together with cottages ornés, located favourably overlooking the English Channel. Many of the properties located in the Undercliff have strong historical connections with famous writers, artists and politicians from the Victorian period.

4.1.5. Coastal Art History

The Hampshire coast, including the great maritime ports of Portsmouth and Southampton, received considerable attention from artists from the late-eighteenth century. Many artists travelling to the south coast on the London road paused at Portsdown Hill to paint the panoramic view across Portsmouth to the Solent and the Isle of Wight beyond. Dominic Serres painted the view in 1778 and William Daniell included the view in the latter part of his tour. Later, William Turner of Oxford also painted one of his extensive views from this elevated position, whilst James Callcott (fl.1843-1896) produced a pair of oils from a similar spot. Porchester Castle and the Round Tower at the entrance to Portsmouth Harbour were subjects chosen by John Cantiloe Joy (1806-1866), whilst both Thomas Rowlandson (1756-1827) and, much later, Martin Snape (fl.1874-1901) both painted views at Gosport. The painter and etcher of marine and shipping subjects, William Lionel Wyllie RA RI RE (1851-1931) lived in a villa overlooking the entrance to Portsmouth Harbour and also produced views in the Solent and Spithead in both oils and watercolours, for example his *'Harvesting from the land and the sea'*, a scene on a shingle beach along the Solent shoreline.

The Naval port of Portsmouth and shipping and regattas in the Solent and Spithead also attracted leading British marine painters to the city including John Thomas Serres, who painted *'A Frigate Coming in to Portsmouth Harbour'* past the Round Tower in 1794. William Smyth (d.1837), William Adolphus Knell (c.1805-1875), George Chambers RWS (1803-1840), John Wilson Carmichael (1800-1868) and William Frederick Mitchell (c.1845-1914) who painted ship portraits, produced numerous paintings in the harbour or at its entrance. At Southampton, Sebastian Pether (1799-1834) painted a moonlit scene of *'A View of Lord Landsdowne's Tower, Southampton'*. Later, William Henry Bartlett, the prolific topographical artist, engraver and book illustrator (1809-1854), produced a fine view of the city walls from the beach before the extensive reclamation along the waterfront.

On the Hampshire coast, prolific artists included George Arnold ARA (fl.1807-28), William Bellers (f.1762-1773), George Chambers (fl.1852-1862), together with such well-known names as John Cleveley (1747-1786), Alfred Clint (1807-1883), James Francis Danby (1816-1875), Anthony Vandyke Copley Fielding POWS (1787-1855), Edwin Hayes RHA TI ROI (1820-1904), John Linnell (1792-1882), Dominic Serres RA (1722-1793), William Shayer (1787-1879) and Alfred Vickers (1786-1868). Those artists with a coastal or Naval upbringing or training can be distinguished for the quality and accuracy of their works. These include Edward William Cooke RA (1811-1880) and John Wilson Carmichael (1800-1868). Richard Livesay (fl.early-1800s) was one of a number of drawing masters at the Royal Naval College, Portsmouth, having succeeded the eminent artist, John Christian Schetky (1778-1874). Wilfrid Williams Ball (1853-1917) painted watercolours on the Hampshire coast such as *'Lymington'* in 1917, as well as illustrating colour plate books for A. & C. Black.

The Isle of Wight coastline first came to the attention of artists and writers who were in search of picturesque scenery in the late eighteenth century (Wyndham, 1793[3]; Christie's, 2002[4]; Tomkins, 1796[5]; Pennant, 1801[6]; Gilpin, 1804[7]). Travel to the Isle of Wight and the discovery of the varied coastal scenery arose partly as a result of the French Revolution and the Napoleonic Wars, which prevented travel to Europe and resulted in writers, antiquarians and artists paying greater attention to such picturesque landscapes.

William Cooke travelled to the Isle of Wight in 1808 and described the Island in the following way: "*the two sides of the Island present each a peculiar character, as distinct, and as strongly opposed as their aspects. The northern side is marked by all that is lovely, rich and picturesque; the southern side, commonly called 'the back of the Wight', abounds in bold wild rocks, precipitous projections, ravines, fearful chasms and other features of the opposing and even of the sublime. In parts it is true these opposite characters are greatly mingled – a circumstance that only adds to the effect produced upon the observer"* (Cooke, 1803[8]).

Antiquarians, landed gentry, and patrons of the arts living along the Hampshire and Isle of Wight shorelines became influenced by the Picturesque style as exemplified by the works of such artists as Claude Lorrain, Nicholas Poussin and Salvator Rosa. They purchased copies of finely illustrated topographical accounts of travels in this region by such eminent authors and illustrators as Tomkins (1796)[5], Pennant (1801)[6], Englefield (1816)[9], Raye (1825)[10], Rowe (1826)[11] and Brannon (from 1821)[12]. Some of the finest examples of the aquatint process of engraving were those produced by William Daniell in the 1820s for his publication '*A Voyage around Great Britain*' (Daniell & Ayton, 1814[13]), which included nine plates of the Isle of Wight coast and one plate of Portsmouth entitled '*View from Portsdown Hill*'.

Mid-to-late eighteenth century landscape painting on the Isle of Wight is dominated by three important watercolour artists who were all painting here at about the same time, John Nixon (c.1750-1818), Thomas Rowlandson (1756-1827) and, slightly later, Charles Tomkins (1757-1823). John Nixon was an amateur landscape painter and caricaturist who toured Britain, Ireland and the continent in the 1780s and 1790s often working with other important artists. He provided drawings for Thomas Pennant's '*Journey from London to the Isle of Wight*' (Pennant, 1801[6]) as well as for the European Magazine; a fine collection of his watercolour drawings is held by Carisbrooke Castle Museum.

Thomas Rowlandson was an outstanding artist and draughtsman and was by far the most popular British artist of the Georgian period. Rowlandson visited the Isle of Wight in about 1784 with his long-standing friend, artist Henry Wigstead (c.1745-1800), but returned in 1791 to undertake a more comprehensive tour. Charles Tomkins published his '*Tour of the Isle of Wight*' in 1796, (Tomkins, 1796[5]), the text being accompanied by eighty delicate sepia aquatints of coastal and inland views. Tomkins' aquatints compared favourably to the rather coarse copperplate engravings in Sir Richard Worsley's '*History of the Isle of Wight*' (Worsley, 1781[14]).

Perhaps the most spectacular series of picturesque views of the Isle of Wight are the large aquatints by Thomas Walmesley (1763-1806), titled, in English and French, '*Select Views of the Isle of Wight and Environs*' and published by James Daniell between 1800 and 1810. His views are more reminiscent of an Arcadian landscape, and are topographically inaccurate. The nineteenth century was a remarkable period for Isle of Wight art, with some nine hundred works being exhibited at the Royal Academy and other principal London exhibitions. A vast number of paintings and watercolours were produced in Queen Victoria's reign alone and for every fine painting that was exhibited there were perhaps one hundred that were not. Art and drawing were part of the upbringing at that time and thus there were hundreds of good paintings by Isle of Wight artists, as well as visiting artists, unlisted and unknown to exhibition catalogues.

Robert Lugar in his '*Villa Architecture*' (Lugar, 1828[15]) included a view of Puckaster Cottage, Niton, one of a number of cottages ornés constructed in this area. This style was encouraged by the prominent Regency architect, John Nash, who resided at East Cowes Castle. The owner of Puckaster Cottage, Mr James Vine, commissioned a series of watercolour drawings from Joshua Cristall POWS (1767-1847), first President of the Old Watercolour Society. Mr Vine was also host to J. M. W. Turner, Sir Edwin Landseer and many other artists travelling along the isolated southern coast of the Island at that time. Turner stayed for a while in the village of Niton, both with Mr Vine at Puckaster, and then at The Orchard. This elegant property was the marine villa of General Sir Willoughby Gordon who had been ADC to Wellington in the Peninsular War. After he was invalided home he became military secretary to the Duke of York and purchased The Orchard in 1817. Sir Willoughby and Lady Gordon were also patrons of the arts; Joshua Wedgwood had made them a large personal collection of china based on Lady Gordon's designs. Turner became an art teacher to Lady Gordon and her skills improved steadily under his tuition and with the advice of her friend and fellow visitor, Sir David Wilkie RA.

One of the most important local artistic influences on the Isle of Wight was the artist, engraver and author, George Brannon, and his sons, Alfred and Philip, who worked on the Isle of Wight during the early and mid-nineteenth century, and are recognised as having made a significant contribution to Isle of Wight

art and culture. The publication '*Vectis Scenery*' (Brannon, from 1821[16]), which was commenced by George Brannon in 1821, has provided us with an impression of the Island landscape through the eyes of a local resident over a period that spanned extraordinary changes in terms of the Island's landscape, coastal scenery and economy, particularly during the first half of the reign of Queen Victoria. Brannon's publication '*Vectis Scenery*' included, over its lifetime (1821-1876), a vast range of illustrations of Island towns, inland and coastal scenery as well as country houses and churches. In 1821 Brannon published the first complete volume of '*Vectis Scenery*' and continued for almost forty years until his death in 1860 '*Vectis Scenery*' was just one of the publications by the Brannon family.

In artistic terms perhaps the most important venue on the Isle of Wight from the 1840s was the village of Bonchurch, just to the east of Ventnor. A school of artists developed at Bonchurch, with Seaside Cottage on the shore being rented annually by a succession of eminent names including Edward William Cooke RA, Clarkson Stanfield, Thomas Charles Leeson Rowbotham NWS (1823-1875) and Thomas Miles Richardson Jnr RSA RWS (1813-1890). There is a remarkable similarity in the technique adopted by artists like Richardson, Rowbotham, George James Knox (1810-1897) and Isle of Wight artist William Gray (fl.1835-1883). Their rich 'Mediterranean' palate with the extensive use of heightening with white is typical, and it is almost certain that the prolific Island topographical artist, Gray, was a pupil and painting companion of Richardson and Rowbotham. On one occasion in 1861 the latter two artists painted an identical scene of a coal boat being unloaded on the beach at Bonchurch.

One of Tennyson's most regular visitors was Helen Allingham RWS (1848-1926), who was introduced through her husband William, a poet. Helen was also made aware of the beauties of the Island by an acquaintance, Thomas Carlyle (1795-1881), who had rented a villa at Ventnor for several seasons. Helen's interest in cottage architecture was fulfilled on the Isle of Wight where she painted over a hundred and ten watercolours on successive visits, mainly on the Farringford estate or in the vicinity of Freshwater. On several visits to Farringford she met the important Victorian watercolourist Myles Birket Foster RWS (1825-1899) and they painted together for a number of years. In February 1862 Birket Foster and his family moved to Bonchurch, renting the seaside villa, Winterborne, for a period of recuperation from tuberculosis. Whilst living there, he produced at least ten fine watercolours of children on the beach at Bonchurch or in the adjacent Landslip, and a number of these have been published elsewhere (McInnes, 1989[17], 1999[18], 2004[19]).

The beauty of the south-east corner of the Isle of Wight, and particularly the coastal geology, was exquisitely captured by artists and followers of the Pre-Raphaelite School, John Brett ARA (1830-1902), William Gale (1823-1909), John William Inchbold (1830-1888) and Frederick Williamson (fl.1856-1900). Brett painted views of the Isle of Wight Undercliff scenery at Luccombe, Bonchurch and Blackgang illustrating the remarkable coastal geomorphology of the area in painstaking detail. He was, without doubt, the foremost landscape painter of the outer Pre-Raphaelite circle and he worked exclusively in watercolour until he was fifty but from then onwards turned solely to oils.

Four further artists who painted almost continuously in Hampshire and the Isle of Wight deserve special mention. Alfred Vickers (1786-1868) was a Londoner, who exhibited views regularly between 1832 and 1869. His sketchy style of working in oil has been likened to that of the French artist, Eugene Boudin, and his exhibited Isle of Wight works numbered thirty-three in total. William Shayer (1787-1879) loved the scenery of the New Forest as well as crossing regularly from his native Southampton to paint coastal views of the '*back of the Wight*' or scenes of smuggling or gypsy folk. Julius Godet (fl.1844-1884) made an annual pilgrimage from London to the south coast from 1853 until 1879 with his work being accepted at the Royal Academy or Suffolk Street exhibitions in every one of those years. Finally, the works of Miss Harriet Gouldsmith (1786-1863) are worthy of note. Between 1826 and 1831 she was a prolific exhibitor of oils of the coastal scenery and fisherfolk at Ventnor Bay and Luccombe, painting thirteen works for the Royal Academy and elsewhere over that period.

Marine painters including Charles John De Lacy (fl.1885-1930), Thomas Sewell Robins (1814-1880), Edward Duncan RWS (1803-1882), John Wilson Carmichael (1800-1868) and George Chambers (1803-1840) produced scenes of shipping and craft in the Solent waters. Of local artists, Charles Gregory (1810-1896) and his son, George Gregory (1849-1938), were prolific, although they did not exhibit regularly. Another Solent marine artist, Arthur Wellington Fowles (fl.1840-1860), was well known for his paintings of yachting and regatta scenes off Cowes and Spithead. In 1850 he gave up his employment to concentrate on working as a marine painter, which he continued for the rest of his life. He painted a number of important scenes capturing races and regattas including important craft such as '*Cambria Sailing off Ryde*' and a pair of oils of '*Queen Victoria Reviewing the Fleet at Spithead on 23rd April 1856*' as well as other large scale works of the Cowes waterfront.

The increasing demand for visitor's guides to the Isle of Wight necessitated a change from the relatively expensive books by the Brannon family and others. These were replaced by cheaper guides, often illustrated with chromolithographs or woodcuts. Later, artists were commissioned to paint watercolours of local scenes for reproduction in the first colour plate guides and for picture postcards. This resulted in a wealth of attractive watercolours being produced at the end of the nineteenth century by Henry Wimbush (fl.1881-1908), Alfred Robert Quinton (fl.1852-1930s), William Wells Quatremain (fl.1900s), Alfred Heaton Cooper (1864-1929) and Newport art teacher Fanny Mary Minns (fl.1890s). The publishers A. & C. Black's pencil sketches series followed later with a delightful Island volume by Dorothy Woollard (fl.early 1900s[20]).

4.1.6. Case Study Sites

For this study, two case study locations have been selected for more detailed consideration. These are:

- Portsdown Hill to the Solent, Portsmouth;
- Bonchurch and Ventnor, Isle of Wight.

4.1.7. References

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Case Study 4.1 – North Solent Shoreline, Hampshire

1. Location

The Case Study site considers the view from Portsdown Hill looking south over Portsmouth to the Solent and towards the Isle of Wight.

2. Why was the Case Study Site selected?

This site was selected to illustrate the role that historical artworks can fulfil in helping to inform us of the conditions that existed before coastal defences and other developments took place. An understanding of the natural conditions that prevailed in terms of evolution and coastal processes can support the development of coastal risk management strategies.

The view by William Daniell (**Fig. CS4.1.2. overleaf**) illustrates the relatively undeveloped Portsmouth Harbour with Porchester Castle and the Isle of Wight beyond in 1823. It is interesting because it shows some of the islands and creeks in a largely natural state, where a densely populated sea port now flourishes.

3. Summary of the Geology, Geomorphology & Coastal Processes

The study site is located within the Hampshire Basin and comprises relatively soft rocks from the Cretaceous and Tertiary Periods. Portsdown Hill stands as a ridge of chalk downland extending east to west behind the City of Portsmouth, which developed on Portsea Island. The sheltered Portsmouth Harbour lies to the west of Portsea Island whilst the large tidal Langstone Harbour lies to the east.

For many years, Portsmouth has been at risk from both surface water flooding, and tidal flooding. Tidal flooding presents the more significant risk as large portions of Portsea Island are below sea level, leaving nowhere for flood water to naturally drain after a flood event. In the face of climate change, flood risk is expected to rise as more severe storms will increase pressure on the existing urban drainage network. The East Solent Coastal Partnership of local authorities is leading a major co-ordinated programme to address flood and coastal erosion risk management to protect the City for the next century.

4. How can the art imagery resources inform us of changes that have affected this coastal zone?

The main road from London to Portsmouth passed over Portsdown Hill, a route used by many early writers and artists visiting the south coast and the Isle of Wight in the late eighteenth and nineteenth centuries. The view from Portsdown Hill over Portsmouth is spectacular and would have provided the first view of the sea for many travellers; as a result, artists paused there and often painted the view. These included, in the eighteenth century, Thomas Jones (1870s), John Thomas Serres (1778) and in the nineteenth century William Daniell RA (1824), William James Callcott (1840s), William Henry Bartlett (1848) and William Turner of Oxford (1854). Following ranking the works by Daniell, Bartlett and William Turner have been examined further.

The view by Daniell (**Fig. CS4.1.2.** on page 162 top) is typical of his meticulous observation and eye for detail and he described the location in his famous publication '*A Voyage Round Great Britain*' (Daniell & Ayton, 1814-1825[1]).

"…an excursion was made to Portsdown Hill, the lofty and narrow ridge from whence was taken the annexed view, looking down on the harbour of Portsmouth. The aspect of that grand naval emporium, at this distance, is perhaps more impressive than any which would exhibit to a beholder in its immediate vicinity. On the tongue of land to the right is Porchester Castle. Farther in the distance is Gosport, backed by the Isle of Wight, of which the portion here visible extends from Brading harbour and St Helens road near Ryde. In the harbour Portsmouth are seen some objects strongly characteristic of a time of peace; they are ships laid up in ordinary. Altogether the prospect in this direction is surpassing for its grandeur and variety…"

Daniell's view looks down over Porchester Castle, the Roman fort, towards Gosport and Portsmouth with the Isle of Wight beyond. Twenty-four years later the prolific artist and engraver, William Henry Bartlett, produced a very fine steel engraving from the same location (**Fig. CS4.1.4.**). The extent of the estuary is

very clearly delineated and demonstrates the detail that could be achieved through engraving on a steel plate. The shape of the harbour and the coastline matches very closely Daniell's observations.

A third work from this location was painted by William Turner of Oxford in 1854. Turner (designated as 'of Oxford' to distinguish him from J. M. W. Turner) usually painted coastal panoramas such as this from elevated locations (**Fig. CS4.1.3.**). His style was detailed and topographically accurate. This view is from higher up the hill than the two previous works. Porchester Castle is clearly visible, as is the city of Portsmouth on the left.

5. Key issues that can be learnt from this site.

The following sequence of artworks depict the gradual development of the Portsmouth coastal zone since the early nineteenth century. This development has necessitated protection against flooding and coastal erosion for one of England's most densely-populated coastal cities; flood defence measures are ongoing.

There are also numerous paintings, watercolours and engravings of historic fortifications, including Porchester Castle, the Round Tower at the entrance to Portsmouth Harbour, and the Solent Forts; the artworks illustrate changes to these structures over time.

6. References

1. Daniell, W. & Ayton, R., 1814-1825. *'A Voyage Round Great Britain'*. Longman & Co. London.

Fig. CS4.1.1. *'Map showing the location of Portsdown Hill, Portsmouth'* by Thomas Moule. 1830.

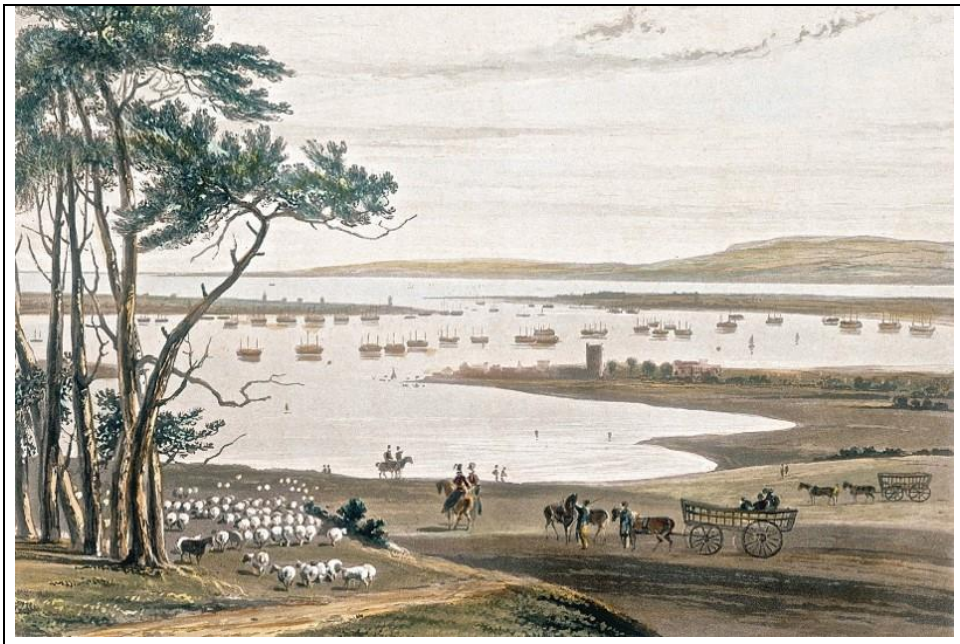


Fig. CS4.1.2. *'View from Portsdown Hill'* (towards the Isle of Wight) by William Daniell RA. 1824. Aquatint engraving.

Fig. CS4.1.3. This fine watercolour by William Turner of Oxford shows the view in 1854 thirty years after William Daniell visited the spot. Porchester Castle is visible to the right, although much of the harbourside still appears relatively undeveloped.

Image courtesy of Bonham's.

Fig. CS4.1.4. *'Portsmouth Harbour and Spithead'*. A very fine steel engraving by W. H. Bartlett (1848). The extent of the coastline near Porchester Castle is drawn in a precise manner.

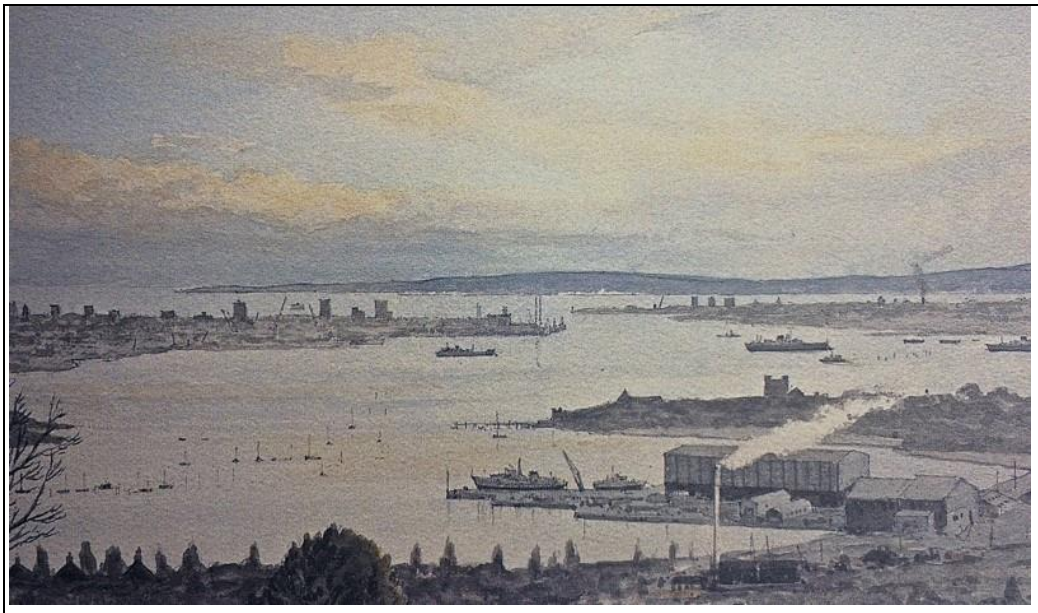


Fig. CS4.1.5. '*View from Portsdown Hill'* by David Addey. Watercolour. 1989. Painted on a November day, the extent of development contrasts dramatically with Daniell's 1824 depiction.

Image courtesy of David Addey.

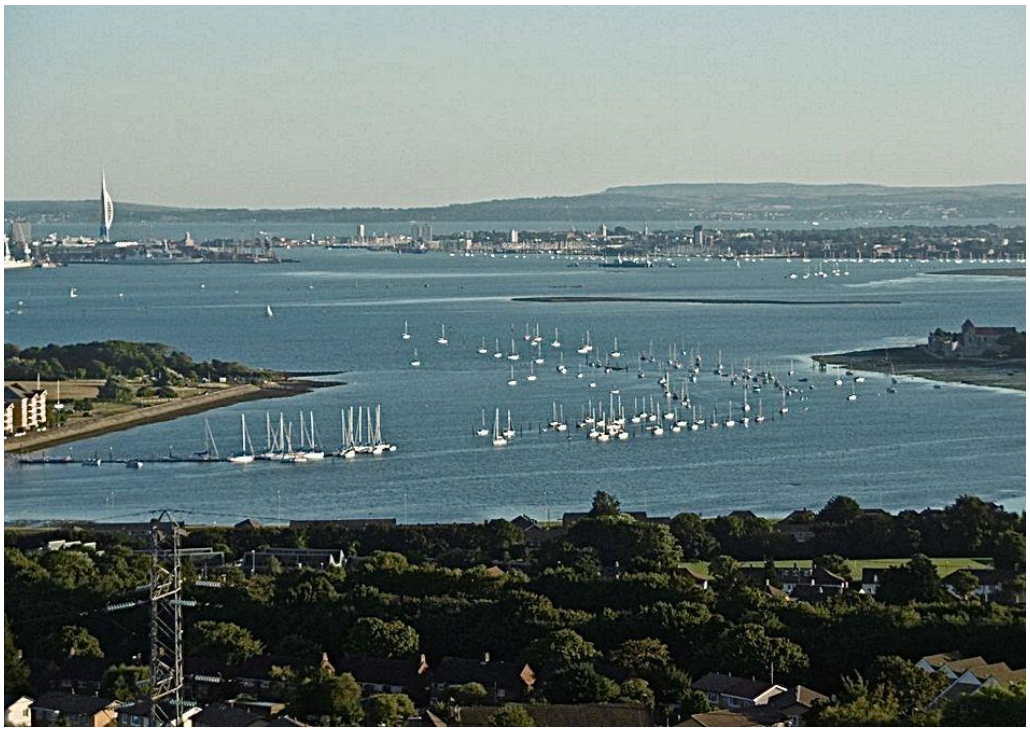


Fig. CS4.1.6. This present day photograph shows the view today.

Image courtesy of © Marathon/Creative Commons Licence.

Fig. CS4.1.7. (below) A view of the entrance to Portsmouth Harbour from the south looking inland. The chalk cutting on the south face of Portsdown Hill can be seen in the distance.

Photograph courtesy of the Wight Light Gallery.

Fig. CS4.1.8. *'Shipping off the Round Tower'* by John Cantiloe Joy. 1806-1866. Watercolour and bodycolour.

Photograph courtesy of Guy Peppiatt Fine Art, London.

Fig. CS4.1.9. This watercolour by W. E. Atkins c.1890 shows the Round Tower at Portsmouth and was painted fifty years after Joy's view (above). The beach can be seen adjacent to the Tower. Vertical timber poles were designed to reduce the reflection of waves from the tower itself.

Image courtesy of Portsmouth City Museum and Art Gallery.

Fig. CS4.1.10. *'The Hard at Gosport'* by Martin Snape. 1919. Oil on canvas.

Photograph courtesy of Hampshire Cultural Trust.

Case Study 4.2 – Luccombe to Blackgang, Isle of Wight

1. Location

This case study site comprises the Isle of Wight Undercliff on the south coast of the Isle of Wight, between Luccombe in the east and Blackgang in the west.

2. Why was the Case Study Site selected?

The Undercliff is a 12km long coastal landslide complex extending between Luccombe and Blackgang on the south coast of the Isle of Wight. The remnants of ancient landslides extend a significant distance offshore and up to 700m inland of the shoreline, where they comprise steep slopes and terraces of up to 120m in height. The site is of considerable geological and environmental importance, as well as having a rich cultural and artistic heritage.

3. Summary of the Geology, Geomorphology & Coastal Processes

The coastal cliffs of the Isle of Wight Undercliff are formed within the Lower Cretaceous sequence of sedimentary rocks, comprising Chalk, Upper Greensand, Carstone and Sandrock. The sequence of strata is strongly bedded with a two degree dip seaward, which exposes the succession to large scale landslides. The sea cliffs are mostly cut into landslide debris, and erosion rates are typically 0.3m per annum. In situ, soft sandstones (Sandrock) form the high sea cliffs at the eastern and western ends of the Undercliff at Luccombe and Blackgang, where erosion rates can be much higher at between 1-3m per year. The Undercliff has experienced a relative increase of sea level and winter rainfall over the historical period, promoting toe erosion and excess groundwater levels, both of which have an adverse impact on stability.

The local authority implemented a Landslide Management Strategy for the Undercliff in 1992 (Moore *et al.*, 1995[1]; McInnes, 2007[2]). The main purpose of this strategy was to engage key stakeholders in the community, to raise awareness of the instability issues, and promote best practice for managing ground instability through a range of practical measures including improved planning and building controls.

Climate change poses a significant challenge to the future stability and management of the Undercliff. The value of site investigations, continuous monitoring of weather, groundwater levels and ground movement rates is of particular importance. The relationships and understanding derived from analysis of these data provided the basis for design of a robust early-warning and response strategies and engineering stabilisation solution; reducing the potential adverse impacts and consequences of landslide events. Reliable assessment of the hazards and risks within large, pre-existing coastal landslide complexes can only be achieved through detailed site investigations, which are needed to inform effective planning and management, such as that being undertaken at this site.

4. How can the art imagery resources inform us of changes that have affected this coastal zone?

In recent years researchers sought to understand more about the formation and development of the Undercliff landslide complex, in order to support effective planning and risk management. A fundamental need was to investigate how the landslide complex was formed and its extent seawards. These issues were investigated using both field geomorphological mapping, as well as interpretation of historical evidence, including old maps, artworks and photographs. The view by William Westall (**Fig. CS4.2.2.**) was particularly useful because it showed the town of Ventnor before the coastal frontage was extensively developed from the 1830s onwards. The planting of the Holm Oak during the early 1900s led to a rapid spread of the species; this, together with coastal developments, masks the coastal geomorphology today. In Westall's steel engraving of 1842 it is possible to identify some of the main components of the landslide complex, including back-tilted blocks of Upper Greensand strata, which detached from the rear escarpment behind and above Ventnor Cove, periglacial deposits of landslide debris that were washed down from the hills behind, and areas along the toe of the landslide at beach level that have been affected by heave. The small steel engraving by Rock & Co. dated 1863, **Fig. CS4.2.3.**, is also particularly significant. It shows the relic of a former cliffline lying seaward of the existing sea cliff. When the Undercliff geomorphology was being interpreted in the early 1990s there was uncertainty as to whether the existing sea cliff represented the seaward extent of the Undercliff landslide complex as a whole. However, this image confirmed that a

succession of clifflines were likely to be present seaward of the existing seafront, and this was confirmed through such historical imagery alongside offshore scientific investigations.

5. Key issues that can be learnt from this site.

Alongside the historical information that artworks provide in support of geomorphological studies, as described above, the selection of images provided in this case study also illustrate physical, environmental and heritage changes over the last two centuries. A selection of oil paintings by the artist, Edward William Cooke RA (**Fig. CS4.2.5.-CS4.2.7.**), who painted in the Undercliff for nearly forty years from the 1830s, provide a rich record of the changing coastline along this frontage by a 'geological painter', who followed the ethos of the Pre-Raphaelite artists of painting nature in an exact and truthful fashion. Such artworks provide a very reliable record of conditions, for example, before coastal protection structures were put in place.

Artworks also illustrate changing natural environments. A significant change in the Undercliff landscape occurred from the early 1900s and after the First World War, when grazing of the coastal fields and slopes effectively stopped. This led to the growth of scrub and trees throughout the Undercliff, which changed significantly the character of the landscape from an essentially open area backed by the dramatic rear cliff of the Undercliff escarpment, into a heavily wooded coastal zone (see **Fig. CS4.2.8. & CS4.2.9.**).

Artworks also illustrated changes that have affected a range of buildings of architectural interest in terms of alterations, additions and losses, for example through landslip and fire, and there are numerous examples of changes or losses to historical structures along this part of the Isle of Wight coast (see **Fig. CS4.2.11.-CS4.2.13.**).

Fig. CS4.2.1. *'Map of the Isle of Wight'* by Thomas Moule. 1830. Showing the location of the Ventnor Undercliff case study site.

VENTNOR UNDERCLIFF – PHYSICAL CHANGE

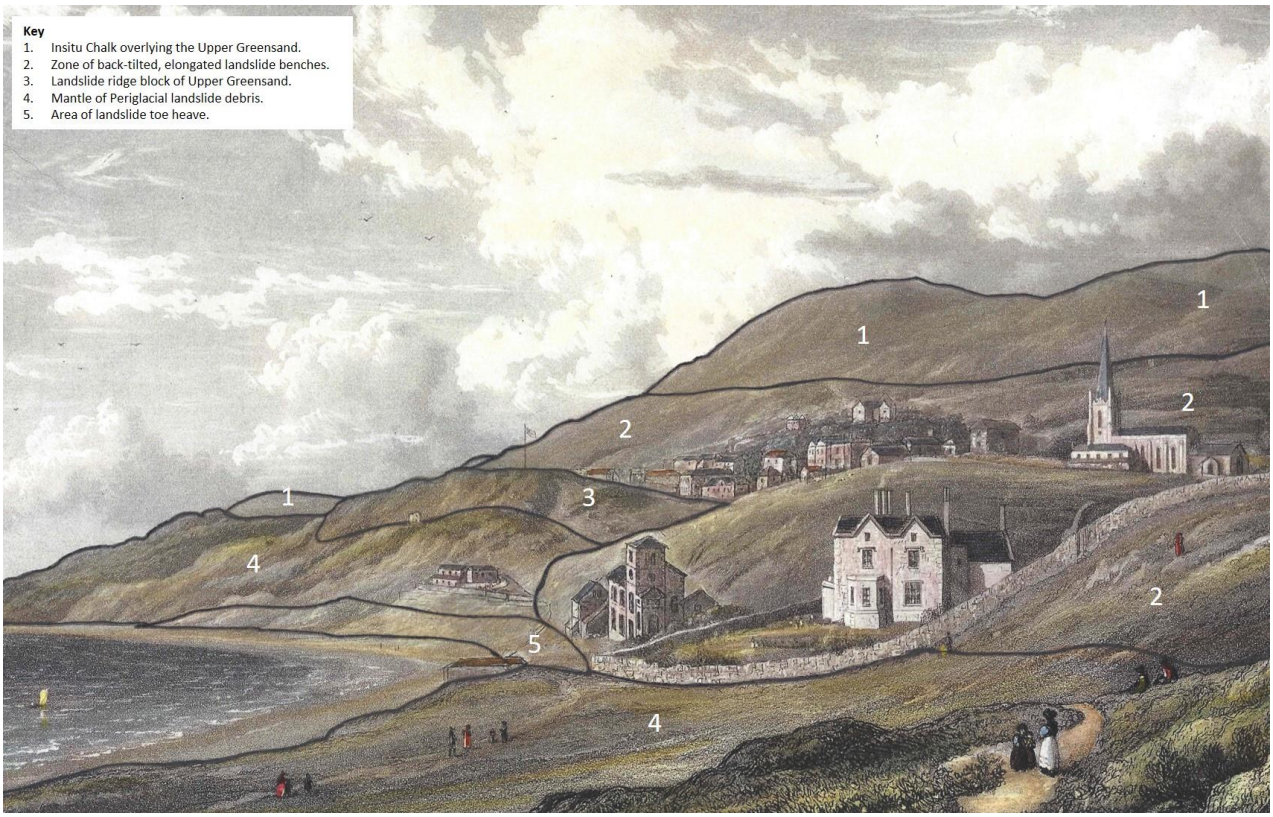
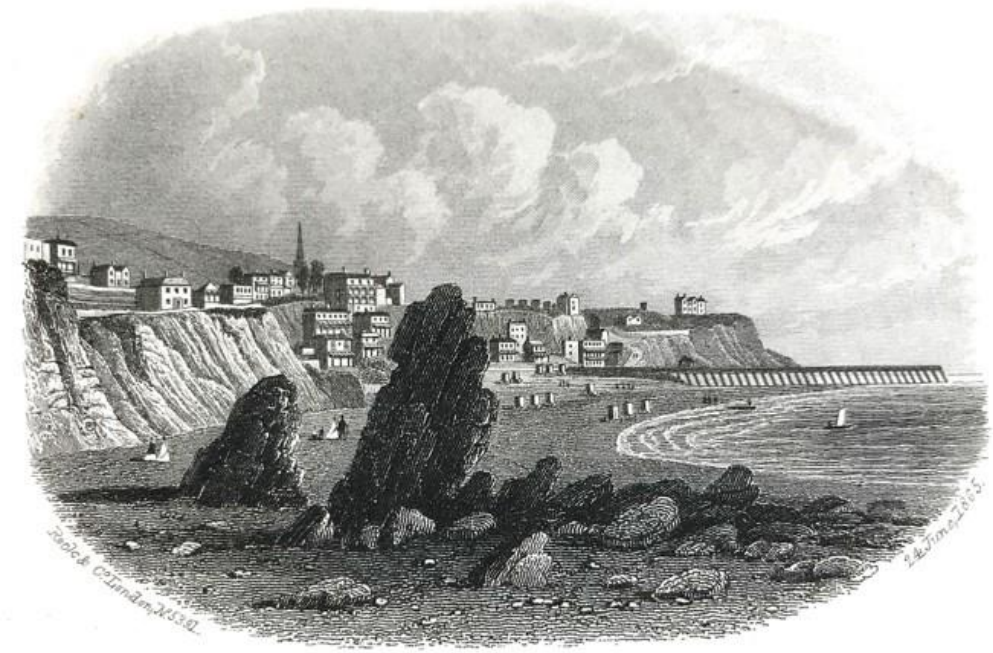


Fig. CS4.2.2. This steel engraving by William Westall (1842) shows the developing town of Ventnor before the coastal slopes became covered by houses and hotels. It allows an appreciation of the key geomorphological units of the landslide complex. A major government-funded study of coastal landslip at Ventnor (1988-91) used such historical images to improve understanding of the causes and mechanisms of ground movements (Moore *et al.*, 1995[1]).

Fig. CS4.2.3. is an engraving of 1863. The image shows projecting rocks on the foreshore that indicate the location of a past coastline, long since eroded. Again, the image supports understanding of coastal change with the largest urban landslide complex in north-western Europe.



VENTNOR UNDERCLIFF – TOPOGRAPHICAL ACCURACY

Fig. CS4.2.4. This aerial view shows the Bonchurch, IW coastline, which was painted in the eighteenth and nineteenth century by many leading British artists.

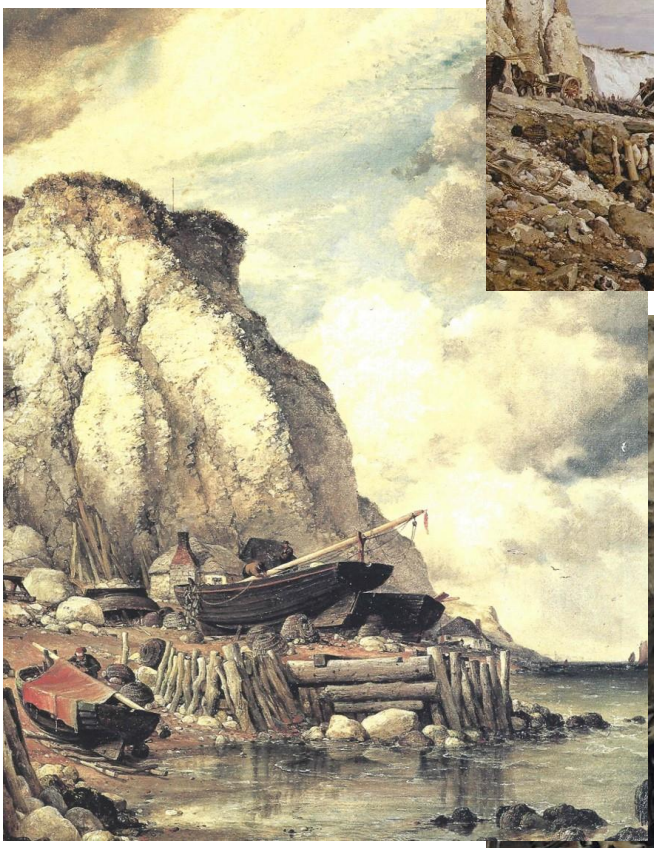
Image courtesy of the Wight Light Gallery.

The three views below show highly detailed depictions of the coast by E. W. Cooke RA, whose keen interest in geology, coastlines and topographical accuracy are very obvious (McInnes, 2014[3]).

Fig. CS4.2.5. (right) Image courtesy of Peter Johnson.

Fig. CS4.2.6. (below left) Private Collection.

Fig. CS4.2.7. (below right) courtesy of Martyn Gregory Fine Art.



VENTNOR UNDERCLIFF – LANDSCAPE CHANGE

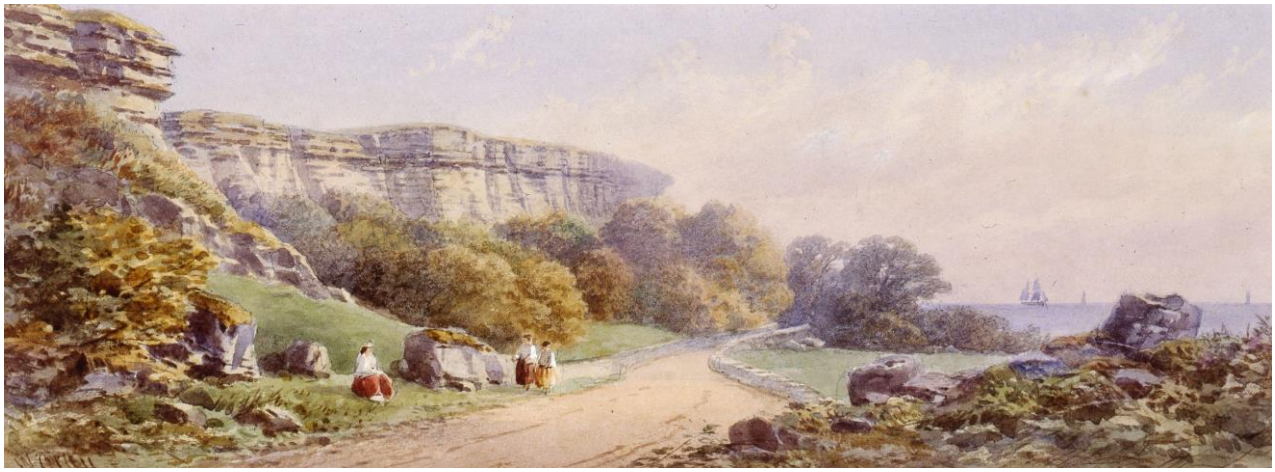


Fig. CS4.2.8. (top) This watercolour of Niton Undercliff c.1855 by William Gray shows the scenery when the coastal land was open and grazed. After grazing gradually died out the Undercliff has become covered by trees and undergrowth, which masks the striking cliffline.

Image courtesy of Isle of Wight Council Heritage Service.

Fig. CS4.2.9. (middle) At Luccombe the open prospects enjoyed in this watercolour by Frederick Williamson (1878) are now obscured by tree growth.

Fig. CS4.2.10. (left) shows the view looking eastwards along the Undercliff from above St Catherine's Point. In the early 1900s acorns of Holm Oak (Evergreen Oak) were planted on the chalk downs behind Ventnor and now form the largest forest of this kind in Northern Europe.

Image courtesy of the Wight Light Gallery.

VENTNOR UNDERCLIFF – LOST HERITAGE

Fig. CS4.2.11 Ventnor Mill at the head of the Cascade stream had existed in antiquity and was painted in 1826 by Harriett Gouldsmith, a frequent exhibitor at the Royal Academy; the mill was destroyed by fire in the 1850s.

Image courtesy of Christie's Images © 2013.

Fig. CS4.2.12. (middle) This extensive view of Niton Undercliff to the west of Ventnor was painted by Susan Kirkpatrick in 1864.

Beauchamp House (centre right) was destroyed by a landslip in 2001. The lighthouse at St Catherine's Point is shown at its original height and was later reduced because the light was obscured by sea mists. In the distance can be seen the Buddle Inn and, beyond, the Royal Sandrock Hotel, which was destroyed by fire in 1984.

Fig. CS4.2.13. (bottom) shows Belgrave Road, Ventnor, in 1868, painted in watercolour by William Gray. The Royal Marine Hotel and the Gothic Folly opposite were destroyed by enemy bombing in 1943.

6. References

1. Moore, R.; Lee, E. M. & Clark, A. R., 1995. *'The Undercliff of the Isle of Wight – A Review of Ground Behaviour'*. Report for South Wight Borough Council. Rendel Geotechnics.
2. McInnes, R., 2007. *'The Undercliff of the Isle of Wight – A Guide to Managing Ground Instability'*. Isle of Wight Centre for the Coastal Environment. Ventnor. 70pps.
3. McInnes, R. G., 2014. *'British Coastal Art 1770-1930'*. Cross Publishing. 260pps. ISBN: 978-1-873295-46-5.

Fig. CS4.2.14. *'Ventnor from the West'* by Randolph Schwabe, painted in watercolour in 1933. This view illustrates the fine detail that can be portrayed through the medium of watercolour. The painting provides an important historical record showing mansions and hotels that have been lost through wartime bombing, landslide or fire; the pier was demolished following a fire in 1993.

Private Collection.