

## 8. Scotland Case Studies

### 8(i). Introduction

The history of Scotland is linked intimately to its coastline, the adjoining inshore waters and the sea. Following the last Ice Age, settlers built houses and early villages in coastal locations, taking advantage of the rivers and the seas as a major source of food, as well as for the purposes of trade. From Roman times, through the medieval period and onwards, fortifications and properties have been constructed, often on dramatic rocky locations around the Scottish coast and on the islands. These relics and buildings tell the story of the development of Scotland over the last 2,000 years.

The people of Scotland have, therefore, always had a close relationship with the sea with approximately 20% of the population living within a kilometre of the coast on the mainland and on the 130 inhabited islands. Many of Scotland's major cities are located near to the coast with a history of sea trade that extends back over the centuries. Along the rugged coastlines many smaller settlements have also developed a distinctive character expanding to meet the needs of their particular locations, whether it is as fishing villages, seaside resorts or more modern villages. With a coastline of approximately 20,000km, much of which is undeveloped, Scotland displays a wealth of coastal landscapes and environments including hard rock and soft rock cliffs, shingle and sandy beaches and dunes, sand spits and salt marshes. Whilst long lengths of the Scottish coastline are composed of relatively durable rocks that are able to largely withstand the impacts of Atlantic storm waves, elsewhere, particularly on the east coast, less resistant low-lying cliff lines and dunes are particularly susceptible to coastal erosion and flooding by the sea, whilst some frontages are also accreting.

Extensive lengths of the Scottish coastal zone are recognised as being of national importance in terms of their landscape value, as well as being important natural habitats and environments. Along these beautiful coastlines, developments illustrate the history of the country dating back to Neolithic times, for example the coastal village site at Skara Brae on Orkney, the numerous historic harbours such as Stonehaven on the east coast and dramatically situated castles including Dunnottar and Culzean. These historical remains illustrate Scotland's outstanding legacy in terms of its archaeology and heritage. These buildings and structures form a national asset of enormous importance, with many of the great castles set in superb locations, often against backdrops of the mountains or the sea.

In Scotland, as elsewhere around the European coastline, there has been an increasing recognition of the pressures faced by coastal zones, not just as a result of natural coastal change promoted by erosion of cliffs and dunes, but also arising from the competing demands of many users of the coastline. In order to reconcile the activities and interests of the many organisations involved around the coast a sustainable framework for coastal management has been promoted to try and reconcile the pressures and conflicts between stakeholders. *Integrated coastal zone management* (ICZM) has emerged as a suitable option for sustainably managing coastal zones around Scotland in the twenty-first century, especially if combined with a pro-active approach to marine planning.

This part of '*The State of the British Coast*' study highlights the added value of works of art as tools to assist in understanding all aspects of long-term change around the Scottish coastline. The author believes that art is currently an under-used resource and it is hoped this study report will increase awareness of the rich heritage contained in Scottish art collections and encourage its use to support sustainable coastal management and the understanding of all aspects of long-term change. The chapter aims to assist scientists, researchers, local authority staff including coastal engineers, planning officers and environment and countryside managers, as well as non-government organisations and other coastal stakeholders, in three ways:



**Fig. 8(i). (above)** *'Stonehaven'* to the south of Aberdeen, depicted by Samuel Bough RSA RWS (1822-1878). Bough was an influential and well-respected artist working in both watercolour and oils. His accurate depictions of the Scottish coast provide a wealth of information on the developing coastal towns through the mid-to-late nineteenth century.

Image courtesy of Lyon & Turnbull.

**Fig. 8(ii). (below)** *'On the Seafront, Largo'* by Duncan Cameron (1837-1916). Views such as this by Cameron show the nature of Scotland's coastal towns and villages as they grew through the nineteenth century providing information on beach conditions and sometimes the coastal defences that were in place at that time.

Image courtesy of Lyon & Turnbull.





- By raising the profile of art held in Scottish national, regional and local collections as an additional resource available to support decision-making;
- By assisting in providing a chronology of coastal change since the late eighteenth century;
- By providing a practical and accessible tool for users that can support the preparation of coastal plans, landscape assessments, strategies and other research.

It has also been recognised, following research over the last twenty years in particular, that an understanding of long-term coastal evolution and the physical processes of coastal change, comprising marine erosion, sedimentary transport and its subsequent deposition, is fundamental to wise planning and decision-making for the future, particularly if, as a result of coastal climate change, these processes may speed up. The implications of sea level rise, as well as more unsettled weather patterns, are likely to increase the hazards of erosion and sea flooding with resulting impacts on businesses, infrastructure and residents around the Scottish coast.

The rocky and highly indented coastline of the mainland of Scotland, especially on the west coast, and fragmented outlines of the Western Isles and Orkney and Shetland made it less easy to define 'coastal cells' using similar criteria to those adopted for England and Wales (Ramsey & Brampton, 2000<sup>1</sup>). However, research identified seven cells along the mainland coasts with a further four cells for the Western Isles, Orkney and Shetland. These cells provide a suitable framework for assessing coastal risk management requirements looking ahead over the next century.



**Fig. 8(iii).** *'The Pier Head, Aberdour'* by Samuel Bough. 1865. This very detailed oil on canvas by Bough illustrates the artist's exceptional skill in depicting such topographical and social subjects along Scotland's east coast. Located opposite Edinburgh on the north side of the Firth of Forth Aberdour has been an important port and destination for visitors since the early nineteenth century.

Image courtesy of Patrick Bourne.

A national overview of coastal change in Scotland was undertaken recently by a team of experts from the Scottish Government, Scottish Natural Heritage and the University of Glasgow (Hansom *et al.*, 2017<sup>2</sup>). Entitled '*Dynamic Coast – National Coastal Change Assessment*' the comprehensive study reviewed Scotland's coastlines dating back to the 1890s in order to support planning for the future of Scotland's coastal landscape. This included addressing risks identified in the UK's Climate Change Risk Assessment and thereby meeting the need for an '*Adaptation Programme*' as required by the Climate Change (Scotland) Act 2009.

The Scottish Environment Protection Agency (SEPA), along with coastal engineers in Scottish local authorities and their planning officer colleagues, have sought to address increasing pressures on coastal zones through an improved more co-ordinated approach to coastal management and the management of erosion and flood risks. Along the Scottish coastline it is recognised that it would be undesirable and, indeed, unnecessary to defend large parts of the coast, for example the extensive hard rock or other slowly eroding frontages. In other locations, where developments are scattered, coastal defence measures may be uneconomic or unsustainable. Around 6% (307km) of the Scottish mainland coastline has been modified for coastal defence purposes. Areas most affected by erosion include Dumfries and Galloway, Shetland and the Western Isles. More recently sites in Fife, Angus and Aberdeenshire have been noted for their significant coastal change. In addition, coastal flooding is predominantly associated with estuaries or where strong onshore winds combine with high tide levels, for example at Largs and Kirkcaldy.

Coastal residents and businesses, particularly in vulnerable locations, are becoming increasingly aware of the risks posed by both erosion and flooding by the sea. Over the last two centuries, particularly during the Victorian seaside development boom, some developments took place in more vulnerable, less sustainable locations. Rising sea levels and the impacts of coastal erosion on cliffs, beaches and dunes, over time, have posed increasing levels of risk to commercial development infrastructure and residential properties, as well as to important environmental assets and habitats.

Fortunately, the Scottish coast was visited by many artists from the eighteenth to twentieth centuries. Painters of the landscape generally create images that we can understand and easily appreciate both for the information they impart and for their aesthetic qualities. The dramatic scenery of the Highlands and Islands, and most other parts of the extensive coastline have been portrayed through the works of celebrated artists and amateurs who painted the varied coastal landforms and landscapes; these, collectively, form an illustrated chronology of coastal change.

Studies commissioned previously by The Crown Estate (McInnes, 2008<sup>3</sup>; McInnes & Stubbings, 2010<sup>4</sup>; 2011<sup>5</sup>; McInnes & Benstead, 2012<sup>6</sup>) demonstrated that artworks do provide an important tool to support other techniques such as coastal monitoring programmes (including air-borne and space-borne techniques, ship-based surveying and ground surveying) to assist our understanding of the complexities of coastal change. It has been recognised, in fact, that works of art extending back to the late eighteenth century, long before the days of photography, can often provide the only record of coastal conditions at that time. Depending upon the accuracy of the work of art, and alongside written accounts, they can provide a useful assessment of the nature, scale and rate of coastal change over the last two hundred years.

The following Scottish case studies consider the physical impacts of coastal change but also review resulting environmental effects and impacts on cultural heritage. In respect of heritage aspects, the work of the SCAPE Trust (Scottish Coastal Archaeology and the Problem of Erosion) form a valuable source of reference ([www.scapetrust.org](http://www.scapetrust.org)).



## References:

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5. McInnes, R. & Stubbings, H., 2011. *'A Coastal Historical Resources Guide for England'*. The Crown Estate. 90 pages. ISBN: 978-1-906410-19-3. [www.thecrownestate.co.uk](http://www.thecrownestate.co.uk).
6. McInnes, R. & Benstead, S., 2012. *'Art and Coastal Change in Wales'*. The Crown Estate 106 pages. ISBN: 978-1-906410-42-1. [www.thecrownestate.co.uk](http://www.thecrownestate.co.uk).
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8. SCAPE (Scottish Coastal Archaeology and the Problem of Erosion). [www.scapetrust.org](http://www.scapetrust.org).



**Fig. 8(iv).** *'Tantallon Castle near North Berwick'* by John Syer. Oil. 1860. There are numerous depictions such as this of Scotland's rich coastal heritage by leading British topographical artists.

Image courtesy of Bridgeman Images.

## 8(ii). The Art History of Scotland

The art history of Scotland and, indeed, that of the British Isles more widely has been described and catalogued comprehensively by a number of authors (Hardie, 1966<sup>1</sup>; Mallalieu, 1976<sup>2</sup>; Halsby, 1986<sup>3</sup>; MacMillan, 1990<sup>4</sup>; Halsby & Harris, 1990<sup>5</sup>; Wood, 1995<sup>6</sup>; Smith & Skipwith, 2003<sup>7</sup>). In Scotland the condition of the country during the seventeenth and eighteenth centuries was not particularly conducive to the promotion of the arts. In fact there were few centuries when nobles were not resisting the authority of either the King or engaged in local skirmishes or battles. It wasn't until the middle of the eighteenth century, when union had been achieved, and the last rebellion had been suppressed, that there came a period of settled wellbeing and prosperity, which initiated a golden age of Scottish literature and art (Hardie, 1966<sup>1</sup>). The works of Robert Burns and Sir Walter Scott raised interest and awareness in Scottish literature, poetry and the landscape, and encouraged the development of the new '*School of Romance*', which fired the imagination of the wider world (Hardie, 1966<sup>1</sup>).

By the late eighteenth century there was a change in attitude towards the Highlands and mountainous landscapes of Scotland in general. Whereas in the past they were viewed as hostile, empty regions that did not merit particular attention, the area emerged as a picturesque, aesthetically pleasing landscape, which depicted nature in all its ruggedness. These perceptions can be illustrated by the accounts of Daniel Defoe and others who penned "*horrific accounts of the blackness and severity of the scenery*" (MacLeod, 2006<sup>8</sup>).

Early painters in Scotland did not see their surroundings as equal to Italianate scenery. Furthermore, the political instability in Scotland and the awkward geography of the Highlands meant that it was even less valued and seldom visited by outsiders, who feared its mountains of "*stupendous bulk, frightful irregularity and horrid gloom*" (Burt, 1754<sup>9</sup>). Of the earliest artists, Robert Adam (1728-1792) was an influential watercolourist, who produced architectural drawings, but he was also a landscape painter. Like so many of the artists of the time he had travelled extensively in Europe and was, therefore, influenced by the picturesque classical landscapes that he had seen on his travels. This was the very early period for watercolour drawing and more significant at that time were the works of painters in oils such as Alexander Nasmyth (1758-1840) and Jacob Moore (1740-1793) who were both pupils of a leading figure in the Scottish art world at that time, Alexander Runciman. Runciman was perhaps the first artist to paint Scottish landscapes in watercolours in the more romantic style that was emerging towards the end of the eighteenth century.



**Fig. 8(v).** 'Loch Coruisk and the Cuchullin Mountains, Isle of Skye' by George Fennell Robson (1788-1833). The grandeur of Scotland's Highlands and Islands was brought to the attention of visitors through magnificent works such as this and his publication '*Scenery of the Grampian Mountains*' (1819).

Image courtesy of V. & A. Images © 2019.

The impact of romanticism can also be seen in the works of late eighteenth and early nineteenth century artists such as Henry Raeburn (1756-1823) and John Knox (1778-1845). Whilst Raeburn is known primarily for his portraiture, Nasmyth and Knox produced fine landscapes of the city of Edinburgh and its environs, as well as architectural subjects such as *'Culzean Castle, Ayrshire'* (1812) and views in the Highlands. Nasmyth, like so many artists of the time, had visited Italy and had also worked in London; he returned to Edinburgh to produce some magnificent landscapes of both city views as well as the coastline.

A contemporary of Nasmyth, John Clerk of Eldin, who was an amateur draughtsman and brother-in-law of the architect and watercolourist, Robert Adam, extended the study of the history of the landscape dramatically. Clerk collaborated with James Hutton by providing illustrations for Hutton's *'Theory of the Earth'*, which was published in 1796, and which revolutionised not just geology but our whole perception of time and of ourselves within it (Hutton, 1788<sup>10</sup>). The superb drawings that Clerk produced are just one of several examples of the very close relationship of art and science at this period. *"To a generation fascinated by everything of an historical nature, a landscape physically falling into ruins could lead people into speculation about aeons of time far older than the foundations of a loch-side castle"* (Hardie, 1966<sup>1</sup>).

The obsession of the age and with all the things ancient is evident at a glance from the titles of contemporary publications such as Cordiner's *'Antiquities and Scenery of the North of Scotland'* (Cordiner, 1780<sup>11</sup>) and *'Remarkable Ruins and Romantic Prospects of North Britain'* (Cordiner, 1788<sup>12</sup>); Grose's *'Antiquities of Scotland'* (Grose, 1797<sup>13</sup>); and Scott's *'Provincial Antiquities and Picturesque Scenery of Scotland'* (Scott, 1826<sup>14</sup>). *"It is noteworthy that the titles to these illustrated works placed antiquities and landscape side by side as companion subjects of the same volume, suggesting a natural connection between ruins and scenery. This implied connection was cultivated in travel literature throughout the period, which seized the same ruins – particularly castles – as suitable subjects for picturesque images"* (MacLeod, 2006<sup>8</sup>).

The creation of the Royal Scottish Academy of Art in 1827 enabled professional painters to exhibit more easily and sell their works. Artists such as Andrew Geddes (1783-1844) and David Wilkie (1785-1841) were perhaps the most successful portrait painters of the time, and alongside them the tradition of Highland landscape painting was being continued by figures such as Horatio McCulloch (1806-1867), Joseph Farquharson RA (1846-1935) and Sir William McTaggart RSA RSW (1835-1910). The Aberdeen born artist, William Dyce RA (1806-1864) was one of the most significant figures in terms of art education in the United Kingdom, as a follower of the Pre-Raphaelites, and famous for his remarkable painting of *'Pegwell Bay, Kent – A Recollection of October 5<sup>th</sup> 1858'*. The period from 1790-1830 saw a rapid expansion in watercolour painting in Scotland. Many artists who wished to record the picturesque scenery and follow in the footsteps of writers and travellers such as William Gilpin made on the spot sketches that they could take back to their studios and later work up into full watercolour drawings. *"By 1826 when the Royal Scottish Academy was founded, there were a significant number of artists who survived entirely on their painting and, of these, many were watercolourists"* (Halsby, 1986<sup>3</sup>).

*"The importance of topography for Scottish artists working in the early nineteenth century reflects the continuing importance of the antiquarian tradition and the whole idea of the role of art as one of the principal means of the acquisition and analysis of knowledge for the world about us. This was reflected in the works of Robert Barker, an Irish artist who produced his first 'panorama' of the city of Edinburgh in 1788, and invented the word to describe it"* (MacMillan, 1990<sup>4</sup>).

One of the pioneers of Scottish landscape painting was Hugh William Williams (1773-1829) whose works, like other early watercolourists of the period, tended to be landscapes composed of thin tinted washes in shades of brown, grey and blue over a carefully drawn outline. He travelled extensively in Italy and Greece and, hence, later he became known as *'Grecian Williams'*. A key figure of the Scottish school was the Reverend John Thomson (1778-1840) who was known as *'Thomson of Duddingston'*. He was encouraged by Nasmyth to paint landscapes and he produced many fine views, mainly in oils of both the coastline and the interior.





**Fig. 8(vi). (above)** *'Kirkwall, Orkney Islands'* by Thomas Oliphant. 1852 from his Journal (MS.10990).

Image courtesy of the National Library of Scotland.

**Fig. 8(vii). (below)** *'Dunnottar Castle'* by James Orrock RI (1829-1913). Many artists chose to depict this dramatically located fourteenth century fortress on the coast to the south of the town of Stonehaven.

Image courtesy of V. & A. Images © 2019.





A further artist who painted the Scottish coast was Samuel Bough RSA (1822-1878). Bough was an associate of the Scottish Academy and favoured views of the coastline to the east of Edinburgh, including, in particular, Canty Bay, looking out towards the Bass Rock at the mouth of the Firth of Forth. He also found inspiration in the fishing villages and harbours of the Fifeshire coast, including views of St Monance, Dysart and St Andrews. He also painted a sunset scene showing *'The Pierhead, Aberdour'* in 1861 and views on the Kyles of Bute looking towards Arran (1854) and on Iona in 1871.

William Leighton Leitch (1804-1883), a Glasgow watercolourist, later became drawing master to Queen Victoria and other members of the royal family. He produced finely detailed views, a number of which were engraved for topographical publications. Clarkson Stanfield RA (1793-1867), Thomas Miles Richardson Jnr. (1813-1890) and Myles Birket Foster RWS also produced numerous detailed coastal views including the Bass Rock and the old pier at St Andrews.

As tourism to the Highlands and Islands increased artists followed their patrons, producing views of the most popular sites that could be purchased by these early travellers and visitors. Painters in oils such as Alfred de Breanski and Sidney Percy (1821-1886) produced fine portrayals of the Highlands scenery and its coastline. Sir William Fettes Douglas (1822-1891), who was born in Edinburgh, became President of the Scottish Academy in 1882 after being Director of the National Gallery of Scotland. Although he was best known for historical and romantic scenes, he also produced views of coastal scenery such as *'Stonehaven'*, *'A Fishing Village'* and *'Lunan Bay, Angus'* north of Dundee in 1890. James Cassie (1819-1899) exhibited at Aberdeen Art Gallery and, again, painted views on the east coast at Aberdeen Harbour, North Berwick, Dunnottar Castle, and around the Bass Rock. He trained under Aberdeen's leading artist and drawing master, James Giles RSA, but increased his output in terms of seascapes from the 1860s. He is best known for his fine views of the harbours, beaches and shorelines of the north-east coast of Scotland.

Giles (1801-1870) was born in Edinburgh and jointly founded the Aberdeen Artists' Society. One of his larger works was *'The Island of Handa, West Coast of Sutherland'* showing numerous sea birds perched in front of the striking stratified cliffline. The sea cliffs, with the bird life, were also painted by Peter Graham RA (1836-1921); a pupil of the naturalistic school of R. S. Lauder in Edinburgh. He exhibited *'Lonely Sea Cliffs where the Gannet finds a Home'* and *'The Cradle of the Sea-Bird'* (1872). James Wilson Ewbank (1799-1847) studied under Alexander Nasmyth in Edinburgh, and was influenced by Dutch marine painting. Although he is well-known for his *'Picturesque Views of Edinburgh'* (Ewbank, 1825<sup>15</sup>) "*he also produced landscape paintings of the Trossachs and Loch Lomond, although he is best known for his seascapes*" (Halsby, 1986<sup>3</sup>). An artist of the same period was Edmund Thornton Crawford (1806-1885), who produced marine subjects also influenced by the Dutch style; he painted *'Ebb tide, Dundee from Broughty Ferry'* in oils in 1856.

The work involved in the discovery and recording of the Scottish coast following travels by early writers, artists and poets in search of the picturesque, is clearly illustrated in the monumental work of William Daniell and Richard Ayton, who travelled extensively around the Scottish coastline, recording the scenery in delicate aquatints accompanied by a detailed descriptive account (Daniell & Ayton, 1814<sup>16</sup>). After Gilpin's publications on picturesque scenery (Gilpin, 1789<sup>17</sup>), poets and writers chose to visit the Highlands, often recording their expeditions in journals, with both illustrations and the written word. An example is the journey made by John Keats with his friend, Giles Armitage Brown, in 1818 (Walker, 1992<sup>18</sup>; Hebron, 2006<sup>19</sup>). A range of topographical accounts and publications were available to inform early travellers and antiquarians who explored the Highlands and Islands and recorded their journeys in aquatint, lithography or engravings accompanied by descriptive letterpress (for example, Burt, 1754<sup>9</sup>; Pennant, 1772<sup>20</sup>; Mawman, 1789<sup>21</sup>; Garnett, 1800<sup>22</sup>; MacCulloch, 1824<sup>23</sup>; Wilson, 1842<sup>24</sup> and Weld, 1860<sup>25</sup>).

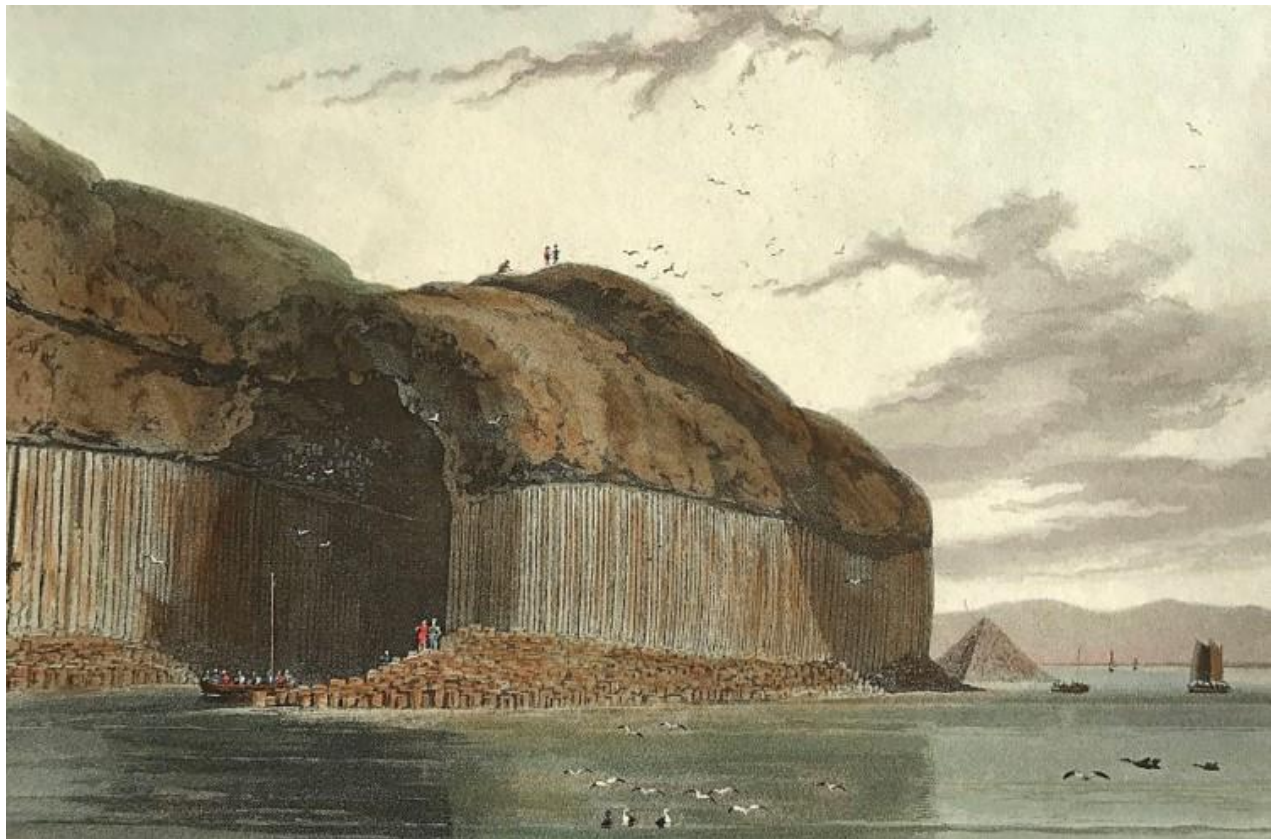
The voyage by Daniell and Ayton had commenced in Cornwall in 1814 and took eleven years to complete, with Daniell's Scottish views, delicate sepia aquatints, being undertaken in the earlier part of the voyage. Daniell produced over 100 views of the Scottish coast, including many of the Western Islands and Orkney. He would travel and paint during the summer and work on his aquatints during the winter period. Later, the Finden Brothers published their *'Ports, Harbours, Watering Places and Picturesque Scenery of Great Britain'* (Finden, 1838<sup>26</sup>) that included numerous steel engravings of the Scottish coast, together with a detailed accompanying descriptive account.

To meet the needs of wealthy travellers, publications such as *'Ports and Harbours'* and *'Scotland Illustrated'* by William Beattie, which was published in 1838, with plates by Thomas Allom and William Henry Bartlett and others, provided a comprehensive illustrated account of the Scottish landscape and coastline (Beattie, 1838<sup>27</sup>). It followed in the footsteps of important Scottish publications that illustrated the topography and heritage of the country such as *'The Border Antiquities of England and Scotland'* by Sir Walter Scott, published in 1814 (Scott, 1814<sup>28</sup>). Later, Michael Bouquet's magnificent lithographs contained in *'An Artist's Ramble in the North of Scotland'* provided the ultimate record of a visit to Northern Scotland at that time (Bouquet, 1849<sup>29</sup>). Engravings by both Daniell and Finden were used by Sir Walter Scott as illustrations in *'Heart of Mid-Lothian'*.

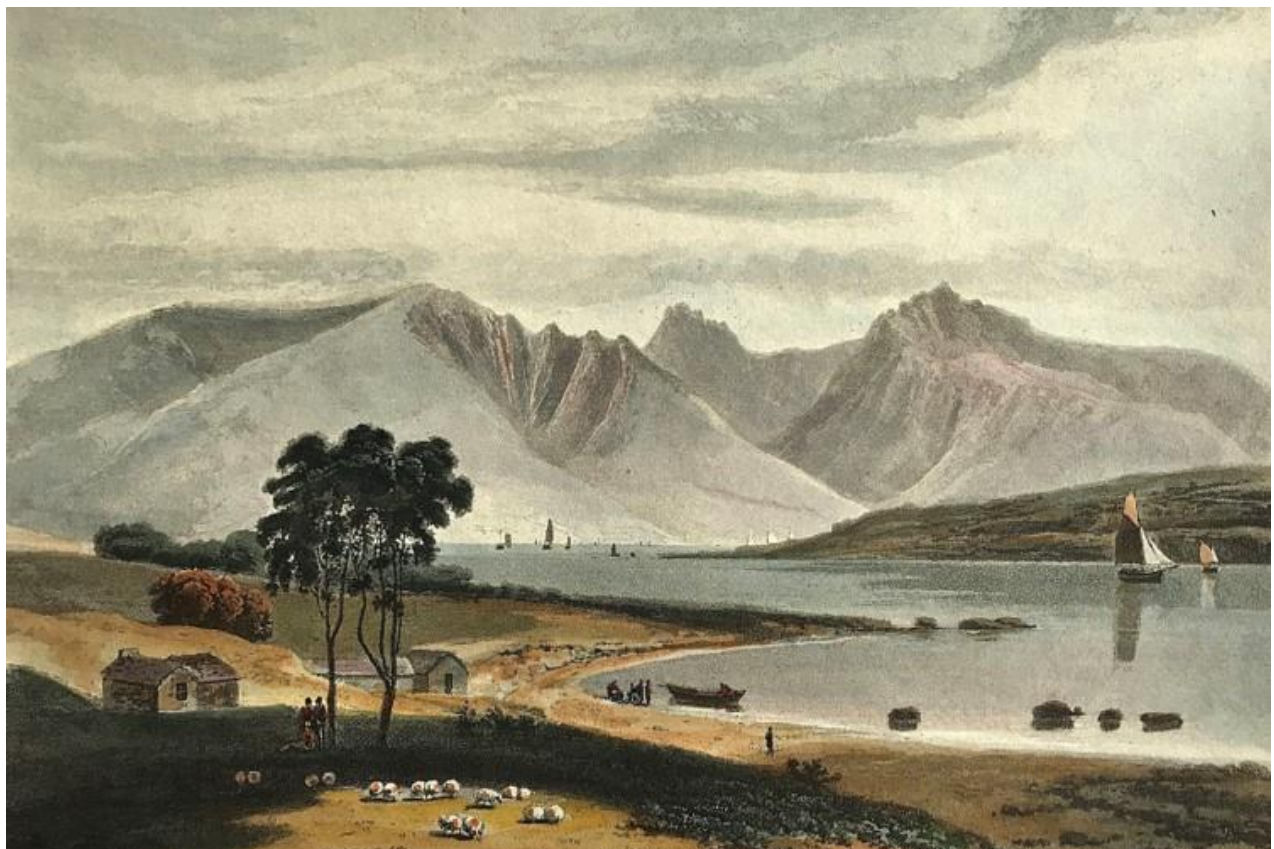


**Fig. 8(viii).** *'Port Patrick, Wigtonshire'* by William Daniell RA (1816). This aquatint engraving by Daniell from his *'Voyage Round Great Britain'* (1814-1825) illustrates the quality of his draughtsmanship and the detail that can be provided by his images both topographical and social.





**Fig. 8(ix). (above)** *'Entrance to Fingal's Cave, Staffa'* by William Daniell RA (1820). Daniell's numerous geological and geomorphological views of the Highlands and Islands introduced early visitors to the exceptional quality of Scotland's natural environment. **Fig. 8(x). (below)** also by Daniell shows *'The Isle of Arran'* taken from near Ardrossan. Such views not only show the grandeur of the mountain scenery, but also provide information on the nature of the shoreline, beaches and coastal habitations at that time.



There is, therefore, a long history of topographical painting in Scotland. Edwin Dayes (1763-1804) had been commissioned in 1789 to prepare watercolours of northern Scotland from sketches made by John Thomas Stanley (1766-1850). These included *'Rocks on the Shore of the Bay of Scalpa'* showing the vertical strata in the cliffline. David Allan painted a watercolour of the Firth of Forth at South Queensferry in 1798. In about 1803 John Glover OWS (1767-1849) painted an extensive view of *'Oban, Scotland'*, which was exhibited at the Society of Painters in Watercolours three years later. Burntisland, on the coast between Aberdour and Kinghorn on the south coast of Fife was also painted regularly. Andrew Wilson (1780-1948) painted the view here in 1823. A view of *'Edinburgh from Across the Firth of Forth'* was also painted in oils by John Wilson Carmichael (1800-1868) in 1862; the view was painted later by Myles Birket Foster RWS in 1863 and by the Pre-Raphaelite Follower, Edward Hargitt RI ROI (1835-1895), in 1865. The harbours and ferry ports were painted by many artists as tourism developed. A. P. Elder produced a large oil on canvas of *'The Western Island, Tobermory'*, whilst Richard Ansdell RA (1815-1885) painted *'Waiting for the Steamer, Crenan Bay; the Islands of Jura, Islay and Mull in the Distance'* in 1872. Duncan Cameron (fl.1870-1900) painted *'The Harbour at St Andrews'* in 1876, whilst James Syer (fl.1860s-1870s) produced *'A Panoramic View of Oban Harbour'* in 1888.

An important figure in the development of British art was William Bell Scott (1811-1890), who worked mainly in England, although he was born in Edinburgh. He came into contact with many of the leading artists of the time such as Richard Dadd (1819-1886) and William Powell Frith RA (1819-1909), later becoming Head of Newcastle School of Art, where he met the Pre-Raphaelite artist, William Dyce. Sir Noel Paton (1821-1901) and his brother, Waller Hugh Paton (1828-1895), were important figures in the Scottish Pre-Raphaelite movement, and *"were well-known as landscape painters of great skill"* (Halsby, 1986<sup>3</sup>). Paton's work came to the attention of the art critic, John Ruskin, who commented favourably on his landscapes. Major works include his 1873 large oil of *'Entrance to Cuiraing, Skye'*, which was exhibited at the Royal Scottish Academy in 1873 (No. 107) and *'Brodick Bay, Arran'* painted in 1884. The artist, George Vicat Cole RA (1833-1893), painted a dramatic scene of *'Loch Scavaig'* on the Isle of Skye in 1875; the work was exhibited at the Royal Academy in the same year. The painting had originally been titled with a quotation from Sir Walter Scott's *'Lord of the Isles'* and the huge canvas was completed in just thirty days. The Pre-Raphaelite artist, John Brett ARA (1830-1902), painted detailed views on the west coast of Scotland including *'Loch Linnhe Bay'* in 1883, *'Dunollie Castle'* (1885) and *'The Isle of Arran from Farland Head'* in 1886.

John Adam Houston (1813-1884) was a further member of the Scottish Pre-Raphaelite landscape school. Painting mainly in watercolour he produced views of the Highlands. He was influenced also by Ruskin, and he may have attended Ruskin's lecture in Edinburgh in 1853. He produced meticulous views showing every detail of the landscape in his paintings. His mountainous views of the Island of Skye and Loch Long are particularly fine. A further artist who painted in what may be regarded as Pre-Raphaelite detail, was James Ferrier (fl.1840s-1870s), who exhibited at the Royal Scottish Academy from 1843. Most of his paintings are of the west coast including the Isle of Arran, and they provide accurate depictions of the landscape at that time. George Houston RSA RSW (1869-1947) painted scenes on Iona, Arran and on the Clyde as well as on Islay in the early 1900s.

The influence of the Pre-Raphaelite Brotherhood and their Followers, and, later, the Impressionists and the Post-Impressionists, was part of a trend during the late nineteenth century in which artists turned away from studio subjects and moved towards the painting of landscapes out of doors *'en-plein-air'*. This approach to landscape painting developed both in England and in France and there were interconnections between artistic schools on the French and English coasts. In Scotland a key component of *plein-air* painting was the use of watercolour, which lent itself to sketching quickly in the changeable weather conditions.

An exponent of this art was William McTaggart RSA RSW (1835-1910), who was born in southern Kintyre. He studied at the Trustees' Academy in Edinburgh along with a number of other students, who were later





**Fig. 8(xi). (above)** This watercolour by Edward Dayes (1763-1804) depicts the '*Standing Stones of Stennis, Orkney*'; a popular subject for many artists. A regular exhibitor at the Royal Academy, Dayes was influenced by the great artists J. M. W. Turner and Thomas Girtin. The unique historic environment of the Highlands and Islands is depicted by many artists who provide information on the condition of such sites over the last 200 years and in some cases illustrate effects of coastal change on coastal heritage.

Image courtesy of Lyon & Turnbull.

**Fig. 8(xii). (below)** '*Bishop's Castle, Scrabster*' on the north coast of Scotland near Thurso by Samuel Bough. Watercolour. 1863. Scrabster developed as a small port for the export of Caithness flagstones and, more recently, as a fishing harbour and ferry port.

Image courtesy of Patrick Bourne.



to emerge as an important group in their own right. These included John MacWhirter RA HRSA RI RE (1839-1911), Sir William Quiller Orchardson RA (1832-1910) and Hugh Cameron RSA RWS (1835-1918). McTaggart is particularly known for his depictions of the sea and the west coast of Scotland, with waves breaking on white sandy Atlantic beaches; he also painted similar subjects in oils, sometimes on a large scale. His work was recognised by his appointment as an Associate of the Royal Scottish Academy in 1859 at the young age of 24, where, living in Edinburgh, he was able to paint views of the North Sea coastline around Carnoustie and elsewhere. He was a close friend of Samuel Bough, who was also an influential painter in the medium of watercolour.

McTaggart and his contemporary, John MacWhirter, who early in their careers painted with a Pre-Raphaelite influence, later moved over to a freer style of painting. MacWhirter painted views on the Island of Skye and at Loch Ranza, Arran, on Iona, as well as typically '*On the Coast near Dunoon*'. A number of his works displayed Pre-Raphaelite detail in terms of the depiction of the flora and landscape; which was greatly admired by John Ruskin. David Farquharson ARA ARSA RSW (1840-1907) also painted many fine coastal landscapes including '*Canty Bay, North Berwick*', '*The Yellow Craig, North Berwick*' (1890), '*Noon-Day Shelter*' (1879) and '*Flower May, Aberdeenshire Coast*' (1893). John McGhie (fl.1890s) painted coastal scenes and genre subjects as well as some topographical views, for example, at Anstruther Harbour and Pittenweem Harbour. A number of paintings of golfing are set against coastal landscapes. John Charles Dollman RWS RI ROI (1851-1934) painted a view of gentlemen and their caddies at North Berwick with the coastline and the Bass Rock behind. Sir John Lavery RA RHA RSA (1856-1941) painted '*The First Green, North Berwick*' with the extensive beach and the town beyond, in 1921.

During the mid-to-late nineteenth century topographical artists continued to paint the coastline of Scotland. In particular, these artists met the demands for pictures from visitors to the expanding resorts and villages where they enjoyed the sea air and sea bathing. To cater for the growing numbers of visitors, guidebooks illustrated with steel engravings or woodcuts appeared in increasing numbers. In addition, a number of fine lithographic views which were produced either individually or sometimes in portfolios. Publications by Rock & Co. and Nelson with engravings or chromo-lithographs were particularly popular and were sold widely in the seaside towns.

In the late nineteenth century developments in Scottish art are linked with the Glasgow School, which embraced a number of artists painting up the 1920s. By this time there was much less interest in the precise landscapes of the Victorian and Edwardian periods, instead a new Scottish modern art genre was being created.

The late nineteenth century and early twentieth centuries saw increasing numbers of colour plate books available to cater for the growing number of coastal visitors, as well as the introduction of colour picture postcards by famous companies such as Raphael Tuck and Valentine's. Book publishers including A. & C. Black commissioned a range of artists to paint attractive views that could be reproduced as postcards or book illustrations. In 1904 Black's published '*Bonny Scotland*', which was written by A. R. Hope Moncrieff and illustrated with numerous fine colour plates from watercolour drawings by Harold Sutton Palmer (Hope Moncrieff, 1904<sup>30</sup>); he also wrote '*The Highlands and Islands of Scotland*' (Hope Moncrieff, 1907<sup>31</sup>).

There is, therefore, a rich legacy of landscape paintings, watercolour drawings and various kinds of prints, as well as literature accounts, which illustrate the changing coastline of Scotland. It is possible to make use of these art resources to inform us of changing physical, environmental and social conditions around the Scottish coastline since the 1770s.

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**Fig. 8(xiii).** *'A Berwickshire fishing village'* by James Hamilton Whitelaw RSW ARSA RSA (1860-1922). Whitelaw is best known for his depictions of the fishing villages along Scotland's east coast. His works can inform us of the changing patterns of development at these picturesque locations and, indeed, often show how their character has remained largely unaltered over the last century.

Image courtesy of Lyon & Turnbull.

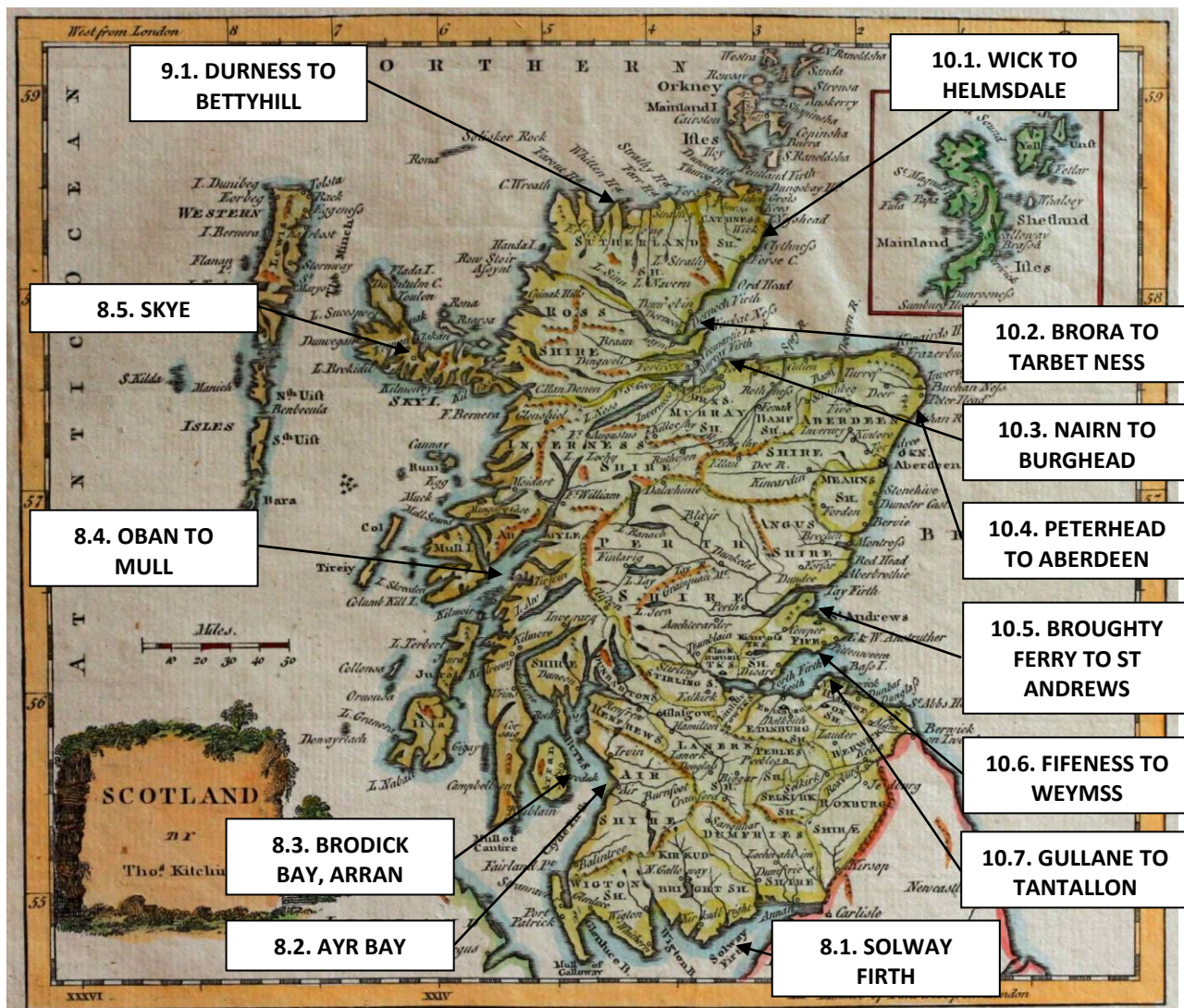


Fig. 8(xiv). Location of Scottish Case Study Sites  
Map by Thomas Kitchin 1764.

## Case Study 8 - Scotland West Coast

### 8.1. Introduction

Commencing at the Solway Firth and extending north to Cape Wrath, this section of the Scottish coast (coastal cells 5, 6 and 7) has a length of 7,960km or 40% of the coastline of the country (Hansom *et al.*, 2017<sup>1</sup>; Hansom *et al.*, 2017<sup>2</sup>). The West Coast is known for its remoteness, and long colourful history of invasion, trade, and industry strongly linked to the sea. The coastal processes are complex due to the fragmentation, the presence of islands and narrow channels, and a terrestrial and marine landscape carved by glacial flows.

#### 8.1.1. Geology & Geomorphology

Along the west coast the bedrock and geomorphology are strongly influenced by past glacial and volcanic periods, with a large igneous component north of the Great Glen Fault and a landscape carved by glacial processes (Fenton *et al.*, 2015<sup>3</sup>; May & Hansom, 2003<sup>4</sup>). The terrain becomes increasingly mountainous towards the north with boundary faults and thrust zones creating a dramatic landscape (Mendum *et al.*, 2001<sup>5</sup>). The structure of the coast is highly fragmented with many lochs, peninsulas, and islands off the coast including the Inner and Outer Hebrides and some lowland areas where sandy beaches exist in the more southerly section (British Geological Survey, 2008<sup>6</sup>). This coastline is frequently hailed as a place of geological splendour, from the time of Hutton to the present day, due to the dramatic formations such as unconformities, massive folding, faults, and raised beaches, which have helped piece together the Earth's history.

#### 8.1.2. Coastal Processes

Due to the presence of so many inlets, firths and bays there are two distinct processes at work, the exposed outer coastal areas experience erosion due to wave action, and longshore drift carries loose sediment into the inlets promoting accretion in the inner coastal regions, in addition to fluvial inputs (Hansom *et al.*, 2017<sup>7</sup>). Glacial processes are still having an effect on the shoreline, as isostatic rebound is occurring at approximately 2mm/year, creating prevalent features such as raised beaches (Mendum *et al.*, 2001<sup>5</sup>). A combination of resistant geology and the relative uplift of the land in the north-west of Scotland reduces risk from erosion and coastal flooding compared with other parts of the British coast (May & Hansom, 2003<sup>4</sup>).

The southern Solway Firth is dominated by soft sediments (51%) with hard sediments making up 45% (Hansom *et al.*, 2017<sup>7</sup>). In this section accretion and erosion rates are currently increasing equally, reflecting the dynamic nature of the extensive saltmarsh environment and relatively closed system within the sediment dynamics of the estuary (Hansom, 2003<sup>8</sup>). Moving northwards along the coast hard rock becomes dominant. The central coastline has a significant section (145km) of artificial coast reflecting an increased presence of coastal protection schemes. Currently erosion rates are stable, with the extent of stability increasing and accretion decreasing –reflecting the effect of human intervention by coastal engineering schemes (Rennie *et al.*, 2017<sup>9</sup>). The longest northerly section of the coast from Mull of Kintyre to Cape Wrath is dominated by 84% hard rock, and the remainder soft glacial deposits. The overall trends in this section are towards increasing erosion in the longer term after a transitional period of little change (Hansom *et al.*, 2017<sup>1</sup>).



### 8.1.3. The Coastal Environment

Due to the extensiveness of the west coast, there is considerable variation in the character of the coastal environment. Much of the coast is sheltered by peninsulas, constantly indented by inlets and lochs (Hansom *et al.*, 2017<sup>2</sup>). The west coast covers a large area, which is for the most part undeveloped and remote, with small towns with long historic links to the area and coast. It is an area which has been greatly influenced by glaciation and deglaciation events, as well as the volcanic and tectonic events responsible for the intrusion of lava and folding of bedrock around the formation of Europe and the North Atlantic Ocean. The natural heritage is preserved in several wetland reserves, within some of the most important estuaries in Britain, designated Sites of Special Scientific Interest, Special Protected Areas, RAMSAR, National Nature Reserves, National Scenic Areas, and Areas of Outstanding Natural Beauty, - particularly Caerlaverock (Chazel & Warren, 2016<sup>10</sup>) - important for hosting nationally significant bird populations including over-wintering geese, native waders, and Natterjack Toads (Perkins, 1973<sup>11</sup>).

### 8.1.4. Coastal Heritage

The Solway Firth has a history influenced by the Romans, Nords, Scots and English. Its English coast, Bowness on Solway is the western limit of Hadrian's Wall - the northern extent of the Roman Empire (Channel Coast Observatory, 2011<sup>12</sup>). There are numerous ruins and restored castles along Scotland's west coast; many of these changed hands during times of conflict. Coastal towns still practice ancient Viking traditions such as Haaf fishing, which is now a designated Heritage Fishery, whilst others were involved with the transport and smelting of iron for the world's railways (Murton, 2017<sup>13</sup>).

Along the entire west coast, between more recent industrial additions such as quarrying infrastructure there are many Listed and Scheduled monument sites; evidence of Iron, Bronze and Stone Age life in the form of hut circles, burial cairns and hill forts, churches and abbeys, the castles of Clan Chiefs, crofter settlements, and salmon and trout traps (Murton, 2017<sup>13</sup>; Sneddon, 2003<sup>14</sup>; Cressey & Badger, 2005<sup>15</sup>). The Scottish Highlands are famous for their rich clan heritage and the islands of Mull and Skye were MacDonald and MacLeod strongholds with castles and fortifications rich in history and legend. Towards the north of this coastline there are a number of shipwrecks, some of the best preserved in Britain dating between 1588 and 1954 (Barling *et al.*, 1996<sup>16</sup>), which are protected by the Designation of Wrecks Act and surrounded by myths of Spanish Gold. This area is the gateway from the sea to Scotland and from land to the Hebridian Islands, where many left to the Americas during the evictions of the Highland Clearances, which affected the area heavily. The main industries on this coast have been small in scale, predominantly agriculture-based farming, macro-algae processing, fishing, mining and distilleries (Barling *et al.*, 1996<sup>16</sup>; Stodart *et al.*, 2008<sup>17</sup>; Land Use Consultants, 2010<sup>18</sup>; Mendum *et al.*, 2001<sup>5</sup>), many of which have been retained and still thrive.

### 8.1.5. Case Study Sites

There are five case study sites along the west coast. These represent a variety of dramatic physical environments and culturally significant sites and are:

- Solway Firth;
- Ayr Bay;
- Brodick Bay, Arran;
- Oban – Mull;
- Skye.

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## Case Study 8.1 – Solway Firth, Scotland West Coast

### 1. Location

This site encompasses the Solway Firth, an estuary 22.5km at its widest point and approximately 35km in length. The inlet is the dividing point between north-west England and the south-west of Scotland. The English coast runs from Maryport in towards Bowness on Solway, joining the Scottish coast at Dornock before running seawards to Castlehill Point, Colvend.

### 2. Why was the Case Study Site selected?

Civilisations are often built around water sources, due to accessibility for ports, trade, travel and the associated agreeable farming conditions. The Solway Firth, although home to larger settlements around Dumfries and Carlisle, is unusual for an estuary in its remote and isolated character, which it has maintained through history (Land Use Consultants, 2010<sup>1</sup>). The cultural history of this area includes the northern extent of the Roman conquest, an area of constant upheaval between Scottish kings and their English rivals, a lasting Viking influence on fishing techniques, the source of iron for the worlds' railways, small villages -some shifted inland by floods, and internationally important marsh and wetland habitats (Hansom, 2003<sup>2</sup>). This mixture produces large areas of natural habitat particularly its internationally important and protected sand dune and saltmarsh systems (Irving & Wolfe, 2015<sup>3</sup>), which all form valuable subjects for monitoring coastal change. The remoteness of this landscape also inspired some artists to paint this coast.

### 3. Summary of the Geology, Geomorphology & Coastal Processes

The bedrock geology in the Solway Firth is dominated by the New Red Sandstone Supergroup. On the English coast horizontal planes of Triassic Sherwood sandstone and Penarth & Mercia mudstone run inland. New Red Sandstone extends into the Scottish coast from Dornock to Powfoot in the inner estuary, where it is briefly interrupted by a Permian mudstone. Towards the west and the estuary mouth the geology comprises predominantly Millstone Grit. The small inlet of the Nith Estuary is underlain Permian breccias also from the New Red Sandstone Supergroup, and the headland at the north-western limit of the study area is harder granite intruded during the Caledonian magmatic events between the Silurian and Devonian Periods. Small pockets of sedimentary rock line the coast in front of the granite at Southernness and Carse Bay (British Geology Survey, 2017<sup>4</sup>).

The last Ice Age was influential in the formation of the estuary, with Holocene glacial processes of sea level rise and isostatic rebound associated with melting ice (6,000 mya) depositing a large abundance of glacial till formations in superficial layers over the Permian-Triassic bedrock. It is a shallow (20m), semi-diurnal estuary which is highly dynamic with fast currents and ever-changing channels and sandbank positions (Land Use Consultants, 2010<sup>1</sup>) phasing between erosion and deposition. The Solway Firth is recognised for its geomorphological representations of saltmarsh development, post-glacial sea and land change in the form of raised beaches and marshes, and at Newbie, organic sediments reveal a geological record of the beginning and end of the Flandrian Transgression. Classified as a Less Developed Inner Firth (Scottish Natural Heritage, 2017<sup>5</sup>), much of the area is designated as SSSI, SPA and SAC (Hansom, 2003<sup>2</sup>) due to these formations and presence of rich intertidal habitats, including the Caerlaverock National Nature Reserve (Chazel & Warren, 2016<sup>6</sup>).

At present the flood tide is superior to the ebb, creating sediment sink conditions within the estuary. Despite seven river inputs into the estuary from the Esk, Eden, Sark, Annan, Nith, Waver and Wampool they carry little new sediment, and erosion and deposition processes continuously redistribute via longshore drift into the estuary rather than adding and removing (Channel Coast Observatory, 2011<sup>7</sup>). Between 1865-1970 coastal change has seen trends of accretion in the western estuary and erosion in the east. During the 1970-2014 period a reversal of these trends occurred in many places returning accreted shores to their previous positions and vice-versa. The net average change between 1970-present is -12.5m with maximum change occurring at Caerlaverock of -595m; compared to a net accretion between 1890-1970 of 23.2m (Hansom *et al.*, 2017<sup>8</sup>). The estuary is calculated to have an intertidal ratio of 0.66 to the tidal range (Channel Coast Observatory, 2011<sup>7</sup>), suggesting that overall a net



depositional environment should prevail until current conditions change.

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

It has been explained that, generally, low-lying coasts, such as the shores of the Solway Firth, were less painted by artists than cliffed coastlines. However, the case study does include views showing the Solway Firth and the wide, open and largely undeveloped nature of this frontage. Literature accounts (such as the description in **Fig. CS8.1. overleaf** by Richard Ayton (1814-1825)) describes the nature of the Solway Firth at that time and the continuously changing processes of erosion and deposition. The changeable nature of coastal conditions described by Ayton accords with the findings of the 'Dynamic Coast Study' (Hansom *et al.*, 2017<sup>9</sup>), which notes increased rates of erosional change along open and mobile soft rock coasts such as the Solway Firth. The case study also illustrates Caerlaverock Castle located on the coast to the south of Dumfries. The engraving by Daniell and the later watercolour by David Addey can be compared with the present day view to illustrate the state of the structure through time. Such illustrated information can supplement other historical records relating to heritage sites.

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

1. Generally, there are fewer artworks of low-lying coastlines, such as the shores of the Solway Firth, compared with more dramatic coastlines or sites containing heritage interest.
2. Increasing numbers of coastal images are becoming available through The Watercolour World project; these may be able to supplement and improve the artistic record for the Solway Firth.
3. The historical images of Caerlaverock Castle contribute to the Historic Environment Record for important sites such as this.

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**Fig. CS8.1.** *'Solway Firth'* by Anthony Vandyke Copley Fielding POWS (1787-1855). Copley Fielding's sepia watercolour depicts the open wild landscape of the Solway Firth. Generally artists tended not to paint low-lying coastlines as they were perceived as being 'less dramatic'. Indeed, William Daniell did not produce a view of this location in his *'Voyage Round Great Britain'* (Daniell & Ayton, 1814-1825). However, sometimes literature accounts exist, such as that provided by Richard Ayton in his text that accompanied Daniell's illustrations. He described the coast in the following way: *"about four miles above Bowness I entered upon the burgh marsh, covered with herds of cattle. It is five miles long and about one and a half broad, and as flat as a planed board, and covered with short grass of the brightest verdure. It is a valuable tract, but is unfortunately suffering continual waste from the advance of the sea. Each coast of the Solway, in its whole length, shows manifest signs of injury from the same enemy, but particularly this marsh which is hollowed to a deep bay with a narrow strip of land at one point of it jutting out more than half a mile into the Firth, and worn away to its extreme point to a few yards in breadth"*.

Image courtesy of © V. & A. Images 2019.



**Fig. CS8.2. (above)** *'Waterfoot, Annan'* (Solway Firth) by William Heavy. Watercolour. 1868. This delicate view of a fishing community along the northern shore of the Solway Firth near Annan reflects the wild, natural beauty of the location.

Image courtesy of Annan Museum.

**Fig. CS8.3. (below)** shows the low-lying shoreline of the Solway Firth, with mudflats backed by saltmarsh.

Image courtesy of © Oliver Dixon Geograph.







**Fig. CS8.4.-CS8.6.** This sequence of illustrations shows Caerlaverock Castle on the northern shore of the Solway Firth to the south of the town of Dumfries.



**Fig. CS8.4. (top)** shows the castle as depicted by William Daniell on his coastal voyage in 1816. **Fig. CS8.5. (middle)** was painted by the architect and watercolourist, David Addey, in 1991. These compare with the present day view (**Fig. CS8.6 bottom**). Such architectural views provide information on the condition of historic properties over time and describe alterations made to such buildings through the centuries (or lack thereof). Such information provides an important record that can supplement, for example, historic environment records.



Images courtesy of Fig. CS8.5 David Addey; Fig. CS8.6 Commons.Wikimedia.org.

## Case Study 8.2 – Ayr Bay, Scotland West Coast

### 1. Location

This 10km stretch of coastline is located on the south-west Scottish coast and extends along Ayr beach from the Heads of Ayr in the south northwards to Prestwick. Offshore lies the southern tip of the Isle of Arran.

### 2. Why was the Case Study Site selected?

This site has a predominantly low-lying coastline, with extensive sandy beaches providing aesthetic and natural coastal protection but also giving rise to complex sediment dynamics; conditions are amplified also by the presence of artificial coastal protection measures. Many artists came to Ayr to paint the remarkable Greenan Castle, which overlooks the Bay (Fig. CS8.8.-CS8.10 overleaf).

### 3. Summary of the Geology, Geomorphology & Coastal Processes

The bedrock on this section of coast is formed predominantly of Carboniferous rocks, intruded at Ayr by mafic and ultramafic igneous rocks including gabbro, which solidified during the Atlantean magmatic event of the Palaeogene. The sedimentary rocks are basal Carboniferous sedimentary and coal-bearing mudstones, siltstones and sandstone rocks from the Coal Measures Super-Group (British Geological Survey, 2017<sup>1</sup>).

The coastal character is in the form of a narrow shelf (Scottish Natural Heritage, 2017<sup>2</sup>). Although the coastline is partially sheltered by Arran and the Kintyre Peninsula, much of this section has been protected by both hard or soft engineering including dune stabilisation and fencing which, whilst protecting the immediate coast to some effect from erosion, has altered the sediment dynamics (RPS, 2018<sup>3</sup>). These defence measures are required due to the low-lying coastal configuration in the northern section of the case study area, which lies below 10m above sea level and the proximity of coastal towns, harbours and other heritage monuments. South of Ayr the coast becomes characterised by cliffs displaying caves carved by present and past higher levels, along with other formations such as raised beaches along much of the stretch (Sneddon, 2003<sup>4</sup>).

The dominant direction of sediment movement is northwards along the coast. Although the majority of the coastline is stable, and some small parts actively accreting as could be expected from a protected shoreline, other parts are eroding as a result of the presence of protective measures further up the coast, in particular in the eastern lee of Heads of Ayr (RPS, 2018<sup>3</sup>). This occurs due to several reasons including the natural differential rates of erosion in different bedrock types. Dredging activity to maintain the harbour at Ayr and other sediment trapping protection schemes may also reduce the sediment load moved along the coast and can contribute to erosion along other parts of the coast. Coastal flooding is considered to be a prominent risk, especially in the area of Troon to the north of this case study site; this is expected to increase with rising sea levels (SEPA, 2016<sup>5</sup>); although erosion is occurring in isolated locations, the levels of change are not currently considered significant (Rennie *et al.*, 2017<sup>6</sup>).

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

The sequence of views showing Greenan Castle at Ayr highlight both the nature of the beach over time and changes affecting this historic monument. In both respects the images suggest very little change has taken place along the coastline at this point over the last 200 years. The availability of the series of images produced by the architectural watercolourist, David Addey, in the 1990s form a valuable intermediate benchmark between those by William Daniell and the present day views.

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

The lack of apparent significant coastal change affecting the beach and Greenan Castle itself provide important information that can contribute to wider understanding of coastal risks and coastal change, along the southern Ayr Bay frontage. The limited change over time within this part of coastal cell 6, Mull of Kintyre to Mull of Galloway, (Rennie *et al.*, 2017<sup>6</sup>) is clearly described in their Dynamic Coast Study Report (Table 6.2, p.33).

## 6. References

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6. Rennie, A. F., Hansom, J. D. & Fitton, J. M., 2017. Dynamic Coast - National Coastal Change Assessment: Cell 6 - Mull of Kintyre to the Mull of Galloway, CRW2014/2.



**Fig. CS8.7.** *'The prospect of the town of Air (sic) from the east'* by John Slezer. Copperplate engraving. 1693. Although such early views are often less detailed and may be less topographically precise, they can offer information on the patterns of development from as far back as the 1650s.





**Fig. CS8.8.-8.10.** This series of views of the south of Ayr Bay show the dramatically located ruin of Greenan Castle, the sixteenth century stronghold of the Kennedy family. At first sight William Daniell's view (top) might be perceived as showing artistic licence, however, the view by the watercolourist David Addey (middle) and the present day view (bottom) illustrate the truthfulness of Daniell's original depiction in 1818. Daniell's view shows the beach close to High Water and a wall bordering the field has disappeared in David Addey's view, where retreat of the coastline is apparent over the intervening period, although the beach here is extensive. Constructed on pyroclastic rocks and other sedimentary rocks affected by volcanic activity, the structure itself appears to have suffered very limited change as a result of rock falls or erosion on the seaward side.

Images courtesy of Fig. CS8.9. David Addey; Fig. CS8.10. © Hamish Kirkpatrick/Geograph.

## Case Study 8.3 – Brodick Bay, Scotland West Coast

### 1. Location

Brodick Bay is located mid-way along the eastern coast of the Isle of Arran inset between the two headlands of Merkland Point and Corriegills. Arran itself is the largest island in the Firth of Clyde, situated between the mainland's coast at Ayr and the Kintyre peninsula.

### 2. Why was the Case Study Site selected?

The whole island is rich in cultural and geological interest, in particular for Hutton's discovery of the 'unconformity', and the case study site lies just south of the Highland Boundary Fault that separates the characters of the north and south parts of Arran. There are 23 Listed Buildings and Scheduled Monuments located in close proximity to the coast of Brodick Bay (Cressey & Badger, 2005<sup>1</sup>). The area has experienced significant coastal retreat since 1890 as a result of coastal erosion and human activity. It is recognised as a 'Potentially Vulnerable Area' in particular relating to coastal flooding (SEPA, 2016<sup>2</sup>) and erosional retreat also is predicted to continue for the foreseeable future.

### 3. Summary of the Geology, Geomorphology & Coastal Processes

Brodick Bay is a geological Site of Interest composed of a mixture of Permian sandstones and breccias of the New Red Sandstone Supergroup in the south, and more resistant intrusive and extrusive igneous rocks including gabbro, lava and tuff to the north. The igneous rocks behind the shoreline are mafic and ultramafic gabbros intruded during the Atlantean magmatic event, and mafic and felsic extrusive lava and tuff from the Devonian Era. The two distinct bedrock types are evidence of the Highland Boundary Fault (British Geological Survey, 2017<sup>3</sup>).

Brodick Bay falls into the coastal character type 'Outer Firth' of the Firth of Clyde. The embayment holds a 1.5km sandy beach, sheltered by cliff headlands. The low-lying coast transitions rapidly through forest and moorland, to the mountainous upland characterising the north of the island, which is designated a National Scenic Area. The most extensive section of raised beaches on the island is at Brodick, sitting 10m above present sea level and 30m inland of the coast (Stodard *et al.*, 2008<sup>4</sup>). It is known to be experiencing erosion due to significant anthropogenic sediment removals during the late 1900s (Rennie *et al.*, 2017<sup>5</sup>), rather than significant wave attack, due to its comparatively sheltered location on the east coast of Arran. This has reduced the 1890 position of the bay by 40m in the northern bay, and 70m in the southern portion where significant development including golf courses and Listed buildings exist in an At Risk state in the light of predicted future change (SEPA, 2016<sup>3</sup>). The beach is backed by sand dunes and cutting through the centre of the bay is a river, which adds complexity to the sediment dynamics of the bay. In 2015 some minor coastal protection was added to curb the loss of sediments (Rennie *et al.*, 2017<sup>5</sup>), with more significant investments planned to protect the future of this culturally valuable area.

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

There are a comprehensive series of views of Brodick Bay because it has long been regarded as a great beauty spot. Dating from the 1850s, the images (overleaf) show expansive rolling dunes with heath and flooded areas, which are much reduced compared with the present day. The earlier sandy foreshore is much narrower and the adjacent narrower dunes are now occupied by a golf course.

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

1. Historical imagery produced by artists acknowledged for their topographical accuracy can contribute to our understanding of long-term coastal change at sites such as this.
2. The range of extensive coastal views illustrates not just the issues surrounding coastal risk but also the wider natural environment of this part of the Arran coast.

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**Fig. CS8.11.** Brodick Bay, Arran by Waller Hugh Paton RSA RSW. 1884. Strongly influenced by the Pre-Raphaelite Brotherhood of artists and praised for his artistic detail by John Ruskin, Paton's coastal views such as this provide an almost photographic reproduction of Brodick Bay in the late nineteenth century.

Looking north along the coast, the bay itself can be seen in the centre with a sandy beach, probably painted close to High Water.

Image courtesy of Patrick Bourne.





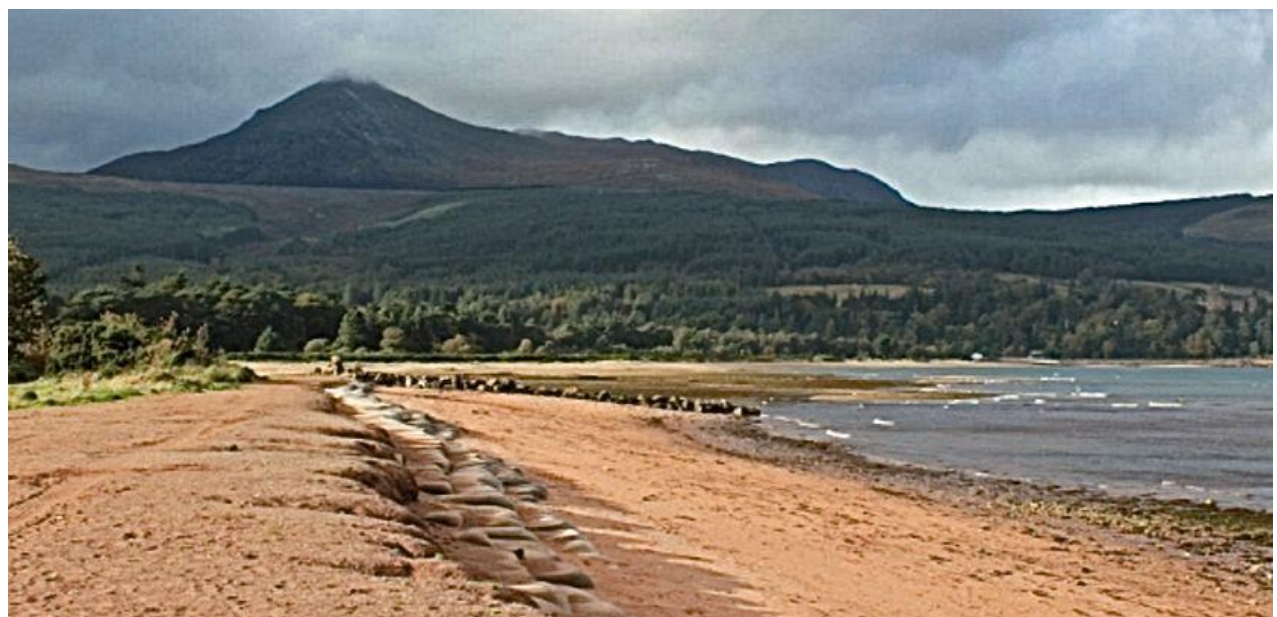
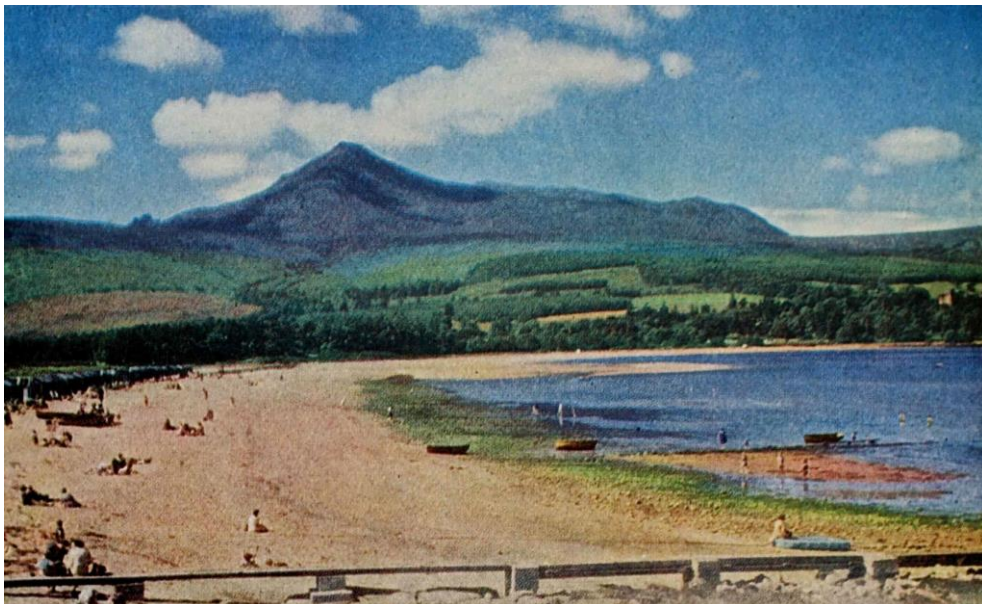
**Fig. CS8.12.-CS8.16. (overleaf)** This sequence of views shows Brodick Bay spanning the period from the 1840s to the present day. **Fig. CS8.12. (above)** shows Brodick Bay painted by Charlotte Canning in 1847. A rocky headland in the foreground, and then the sandy beach can just be seen on the left and with the mountainous landscape to the north of the bay carefully depicted.

Image Courtesy: Royal Collection Trust/© Her Majesty Queen Elizabeth II 2018/Watercolour World.

**Fig. CS8.13. (below)** is a chromolithograph dating from the 1870s and here a pier can be seen in the foreground, together with an extensive sandy beach. There are numerous paintings and prints from the late nineteenth century, which all show a wide beach within Brodick Bay.







**Fig. CS8.14. (top)** a watercolour by Brian Gerald (c.1930s) shows Brodick beach in the tourist season and this scene is echoed in the colour photograph (middle) taken in about 1960. The photograph (bottom) shows erosion measures that have been provided in the form of sand bags to provide a temporary solution to the problem of coastal erosion that has proved increasingly problematic in recent years. Such historical images can be used to support our understanding of long-term coastal change by providing depictions before developments or any coast protection measures have been put in place. This information can support the development of coastal risk management strategies set out in Shoreline Management Plans. Image courtesy of Fig. CS8.16. Ruth Livingstone.

## Case Study 8.4 – Oban to Mull, Scotland West Coast

### 1. Location

Mull is the second largest of the Inner Hebrides, and lies close to the mainland. The study site follows the Sound of Mull from Ardentallen on the central western Scottish mainland, west along the north coast of the Isle of Mull from Duart to Ardmore Point, reaching the northern limit on the tip of the Ardnamurchan Peninsula at Ormsaigmore, and Auliston Point. The northern extent of the study follows the Sound of Mull back towards Oban cutting across the mouth of Loch Linnhe and Dunstaffnage Castle.

### 2. Why was the Case Study Site selected?

This area is seen as a holy grail for geology, holding unique and comprehensive geological formations and records especially due to the volcanic and glacial influences, shaping the land with ice caps and flows, raised cliffs and caves, and the roots of a 60 million year old volcano (Stephenson, 2011<sup>1</sup>) and giving plenty of vistas for artists to recreate. From a cultural perspective it has a rich history involving the skirmishes of the Highland Clans in particular the MacLeods, a beneficial encounter with the Spanish Armada (Barling *et al.*, 1996<sup>2</sup>; Murton, 2017<sup>3</sup>), and is the resting place of several wrecks through the last 500 years as well as coastal castles, chapels and lighthouses. Its natural environments are of international and national importance with SSSIs, SPA and OSPAR designations for habitats and species including birds, cetaceans and benthic communities.

### 3. Summary of the Geology, Geomorphology & Coastal Processes

The case study section encompassed within the Sound of Mull is a large area with a variety of predominantly igneous and Dalradian metamorphosed rocks (Howe *et al.*, 2015<sup>4</sup>). Extrusive lava and tuff from the Mull Lava Group formed during the Silurian-Devonian Periods and intrusive deposits of igneous granite and gabbro create resistant bedrock, particularly on the island of Mull where the root of a volcano still dominates the south and its lava plateau the north (Stephenson, 2011<sup>1</sup>). Small pockets of Jurassic Lias Group mudstone and Permian New Red Sandstone Supergroup line small pockets of coast on Mull having been deposited from 201-299 million years prior to the volcanism, which has shaped the area (British Geological Survey, 2017<sup>5</sup>).

The Sound of Mull is narrow but with a relatively deep central channel (140m) dividing the Isle of Mull from the fragmented coastline of the Morvern Peninsula, characterised as Sounds, Narrows and Islands. To the east of Calve Island there are steep submarine sea cliffs, remnant of a period of lower sea levels, and significant tidal flow where the Sound meets Loch Linnhe and Lorne towards the southern limit of the study area (SSMEI, 2010<sup>6</sup>). The characteristics of the area have been shaped by 3,000 million years of geological history. With underlying bedrock from the Precambrian, the tectonic and volcanic events were associated with the opening of the North Atlantic and the deglaciation processes of the Last Ice Age, and earlier glacial events.

The northern coastline of Mull is scattered with small bays; the area made of Lava plateau and the southern side dominated by the Mull Central Volcano and sea cliffs (Stephenson, 2011<sup>1</sup>). The eastern coast of Mull contains an extensive section of raised cliffs and caves, and glacial terminal moraine deposits. The northern Morvern coast is gentler with ancient coastal forest, some small tidal flats and sheltered inlets (SSMEI, 2010<sup>6</sup>).

There is little erosion due to the resistant nature of the bedrock and the sheltered position of the Sound in relation to open waters or strong currents. Although erosion is not mentioned as a key threat currently (Fitton *et al.*, 2017<sup>7</sup>), for the future it is acknowledged that the effects of climate change, in particular for erosion and flooding, are as yet relatively unknown and have the potential to put coastal assets at higher risk.

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

The large number of historical images illustrated within this case study site provide information on both the nature of the shoreline over time and also its cultural heritage. Whilst many of the illustrations focus on heritage sites such as Aros Castle, Tobermory Harbour, Mingary and Dunstaffnage Castles, they also



show in some of the illustrations the nature of the shoreline, which is generally rocky and subject to relatively little change. These images accord with the findings of the Dynamic Coast Project (Fitton *et al.*, 2017<sup>1</sup>), which points out that 84% of this (Cell 5) coastline comprises hard or mixed geology.

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

1. Changes affecting important coastal heritage sites over time can be observed through the sequences of images. These images can be added to the Historic Environment Records for each individual site, providing colour illustrations alongside other photographic images.
2. The nature of the shorelines abutting the castles, ports and harbours are recorded through the art imagery and provide a snapshot of shoreline conditions at intervals over the last 200 years.
3. The art images illustrate the form and extent of harbour walls and coast protection structures that have existed since the early nineteenth century. These provide useful records for those intending to alter or conserve such historic features.

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**Fig. CS8.17-8.20** show views of Aros Castle, which is situated on the north-east coast of Mull, to the north of the village of Salen. Unoccupied since 1608, this castle was one of a number that were constructed in the thirteenth and fourteenth centuries by Lords of the Isles to protect their territories. The view by William Daniell (top) of 1818 shows the ruin overlooking the Sound of Mull. When David Addey visited the castle on his tour in 1996, he shows an extensive beach visible below the castle at Low Water. He found evidence of the cottage in the foreground of Daniell's view amongst the undergrowth. The present day view (bottom) looking across the mouth of the creek shows a rocky foreshore beneath the castle.

Images courtesy of Fig. CS8.18. David Addey; Fig. CS8.19. © Sarah Charlesworth/Geograph.

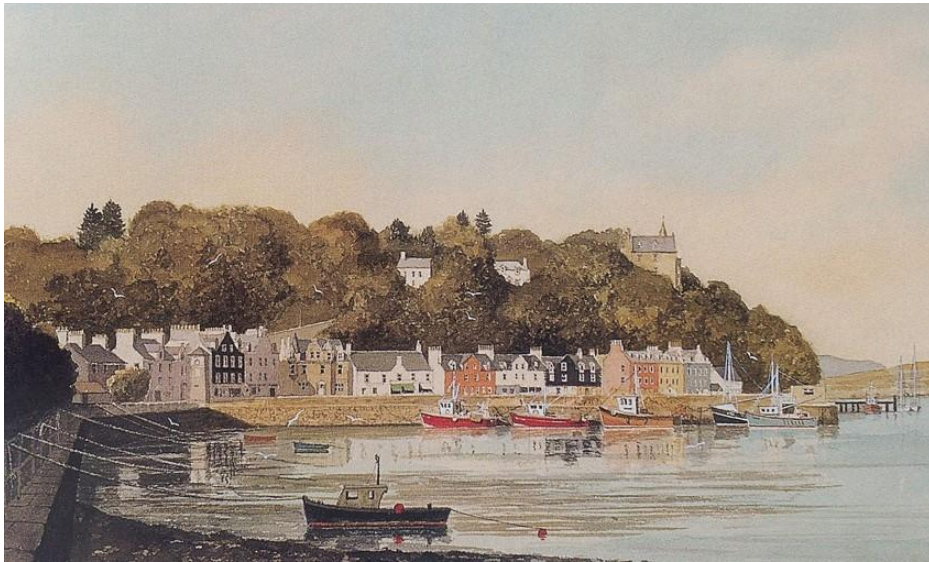




**Fig. CS8.20.** Another dramatic and highly detailed view of 'A Summer Evening, Aros' by Waller Hugh Paton. Late nineteenth century. As with his depiction of Brodick Bay, Paton provides a wealth of detail on the castle, its hinterland and, in particular, the nature of the shoreline environment at the time.

Image courtesy of Lyon & Turnbull.



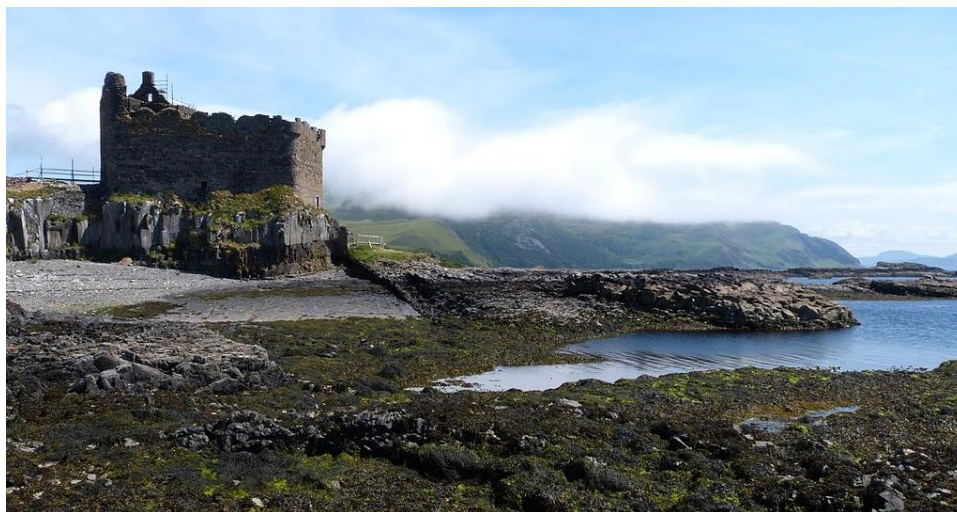


**Fig. CS8.21.-8.23.** depict the picturesque port of Tobermory on the north-eastern coast of the Island of Mull, between 1818 and the present day. William Daniell's aquatint engraving (top) shows the village in 1818 with the relatively undeveloped harbour front. By the time David Addey visited this coast in 1996 (middle) the layout of the waterfront appears very similar to that of the view today (bottom).

A particular strength of Daniell's Scottish views is the quality of his draughtsmanship and the architectural detail. David Addey's views were painted from as close as possible to Daniell's vantage point when he retraced Daniell's journey in the 1990s. These sequences provide a valuable record of the history of many of the Scottish coastal towns and villages and their constituent architecture over time.

Image Courtesy: Fig. CS8.22. David Addey; Fig. CS8.23. © Ian Cunliffe (2007).



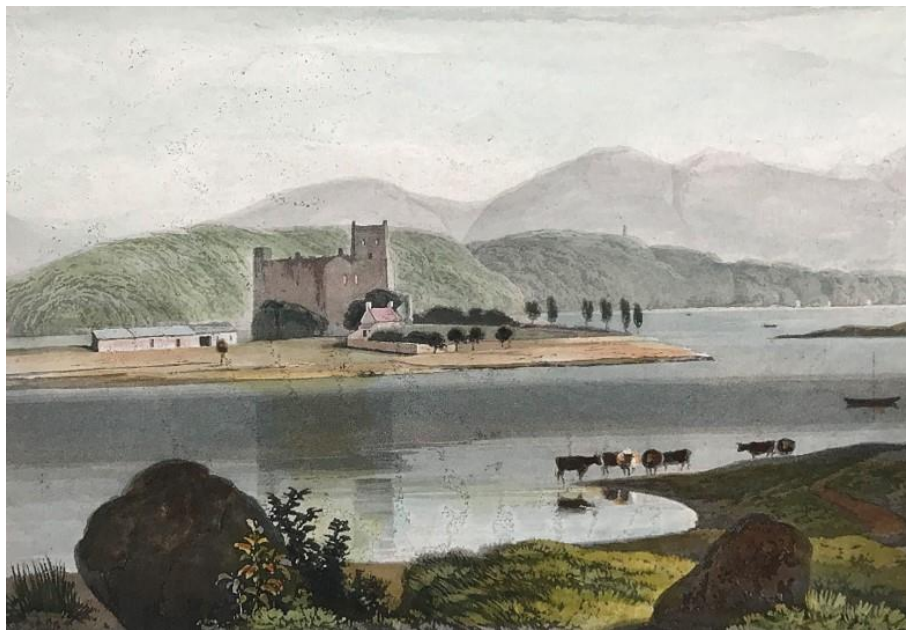


**Fig. CS8.24.-8.26.** show the ruins of another Scottish castle, Mingary, which is located on the south side of the Ardnamurchan Peninsula, overlooking the mouth of the Sound of Mull. This strategically important castle guarded the entrance to the Sound of Mull. Constructed probably in the thirteenth or fourteenth centuries, it provided a stronghold for protection against warring Island clans. At the time of Daniell's visit in 1818 the ruin appears in fair condition, but David Addey's view (middle) of 1996 shows the gradual deterioration of the structure over time. Sometimes artists such as Daniell did not paint their views at low water because they felt the landscape looked "less grand". This means that the nature of the beach is not always displayed in his early aquatint engravings. However, along much of this coast it is a rocky shoreline and, therefore, beach material may be limited, as witnessed in the present day photograph (bottom).

Images courtesy of: Fig. CS8.25. David Addey; Fig. CS8.26. John Haylett © 2013.

Since 2013 the Mingary Castle Preservation and Restoration Trust has been undertaking extensive works, resulting in a transformation of this historic structure, which is now the most intact thirteenth century castle in Scotland.





**Fig. CS8.27-CS8.31. (and overleaf)** show a sequence of views of the historic Dunstaffnage Castle. It is located on a headland to the north of the town of Oban. **Fig. CS8.27-CS8.29.** illustrate its commanding position near the mouth of Loch Etive. Daniell's view (1818) shows the castle and its foreshore, which appears little changed in David Addey's view from the 1990s (middle). Daniell's view is probably from the shore near Oban Yacht Club; the castle is now surrounded by trees.

Images courtesy of Fig. CS8.28. David Addey; Fig. CS8.29. © Christopher Bruce/Creative Commons Licence.





**Fig. CS8.30. (above)** *'Dunstaffnage Castle from the water'* by William Pitt, painted in 1857.

Image courtesy of Lyon & Turnbull.

**Fig. CS8.31. (below)** provides perhaps the most detailed and accurate depiction of the castle and its environs and was painted by George Arthur Fripp RWS (1822-1895), in the 1870s. The fine detail provided in terms of the castle and the shoreline illustrates the suitability of the medium of watercolour drawing for the accurate depiction of the topography.

Image courtesy of V. & A. Images © 2019.







**Fig. CS8.32.-CS8.34. and Fig. CS8.35.-CS8.36. (overleaf)** show a series of touristic views painted in watercolour by the prolific postcard artist and illustrator, Henry Wimbush (fl.1881-1908). The views show this dramatically located coastal town rising steeply from the harbour site, viewed from various spectacular vantage points. Although Wimbush's watercolours tend not to provide the same level of topographical detail as some of his predecessor artists, they can provide information particularly on town architecture, piers and coastal defence structures, and thereby supplement our knowledge of the changing patterns of development in towns such as Oban.



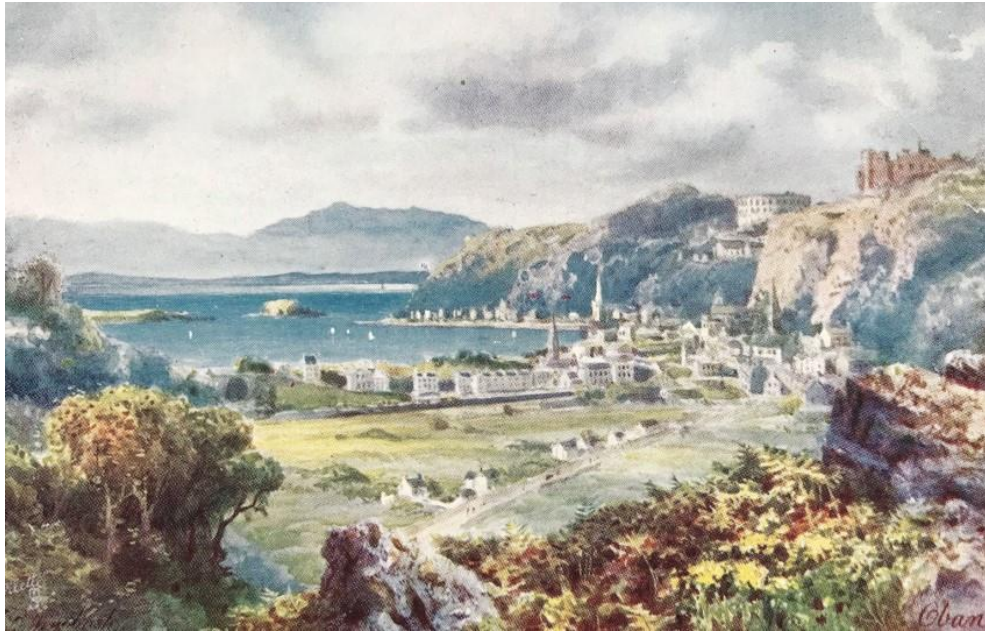
Top: Oban Harbour;

Middle: View across the harbour town of Oban;

Bottom: Oban Harbour looking out.







Top: Oban and the adjacent coastline;  
 Bottom: The picturesque ruin of Dunollie Castle.







**Fig. CS8.37-CS8.39.** This sequence of views shows Ganavan Sands a short distance to the north of Oban. The watercolour (top) by Brian Gerald (c.1930s) shows the healthy bathing beach at this location. Later views from the 1990s (middle) and 2008 (bottom) show the maintenance of the beach in a healthy condition. The winter storms of 2011/12 led to the removal of sand from the upper reaches of the beach, exposing its shingle and cobble foundations; the beach did eventually recover naturally.

Images courtesy of Fig. CS8.40. Andrew Wood/Commons Wikimedia.

## Case Study 8.5 – Isle of Skye, Scotland West Coast

### 1. Location

Skye is the second largest of the Hebridean islands and largest and most northern of the Inner Hebrides. It is roughly 100km in length and is located close to the north-west coast of the Scottish mainland of Applecross and Knoydart, separated by the Inner Sound and Sound of Sleat. Several small islands including Rona, Raasay and Scalpay hug its eastern coast.

### 2. Why was the Case Study Site selected?

As a result of low levels of development throughout history, Skye has maintained a large quantity of historical features, which have been built over in other areas. It is geologically interesting as a result of the formations, glacial and volcanic influence and ongoing coastal processes. The cultural history preserved by the island includes souterrain evidence of prehistoric settlers, Iron Age structures, standing stones and burial cairns, and the Nordic influences of the Vikings who ruled here until 1263 (Sutherland, 1980). Fortifications and castles tell tales of Clan disputes and legacies, and later conflicts of Civil war, including the hiding place of Bonnie Prince Charlie (Murton, 2017<sup>2</sup>). In the lower fertile lands lasting evidence of the Highland Clearances exists as abandoned villages.

### 3. Summary of the Geology, Geomorphology & Coastal Processes

The island is the product of tectonic and volcanic activity, and has several distinct geological areas. The basement rock is made up of the oldest rocks in Britain, 540 million year old Cambrian rocks and the Lewisian Gneiss Complex; in the south-east Sleat Peninsula this is overlain by Torridon Sandstone, whilst the east coast exposes Jurassic Lias Group mudstones, forming the lowest land on the island (British Geological Survey, 2017<sup>3</sup>). The central section, containing the Cuillin Peaks was formed by a volcanic lava reservoir containing mafic and felsic intrusive granite and gabbro during volcanic events 60 million years ago, which also influenced formations on Mull, as well as some metamorphosed limestone. The northern section of the island is a plateau built up in layers by consecutive lava flows over older sedimentary rocks (Emeleus & Bell, 2005<sup>4</sup>).

The geology creates a coastline which is highly irregular, with continuous variation in its character. Although dominated by sea cliffs and peninsulas there are also many bays, sea lochs, and rock formations including small islands, arches, stacks and sea caves. The coastal character of the southern half of the island is classified as Sounds, Narrows and Islands and the northern as Low Rocky Island Coast (Scottish Natural Heritage, 2017<sup>5</sup>). The western extent of the Moine Thrust Zone, the Sole Thrust, cuts through the Sleat Peninsula where the outcrop is exposed at its widest (19km), and shares many characteristics with the Northern extent at Loch Eriboll (Fitton *et al.*, 2017<sup>6</sup>). Mylonites, a laminar rock formation which are a constant characteristic of the Moine Thrust Zone, are formed of recrystallized Lewisian and Torridon rock on Skye (British Geological Survey, 2017<sup>3</sup>). The geomorphological features predominantly result from glacial and volcanic periods. Granite landslips are a particularly distinctive feature of Skye's landscape, including the Trotternish Peninsula, Quirany and Ben Tianavaig, formed when basement rocks collapsed under the weight of the solidified lava layers, and slipped rotationally along shearing beds, prompted by fault instability (Fenton *et al.*, 2015<sup>7</sup>). Raised beaches also feature, as with other sites along the west coast, at three distinct heights (30m, 15m, 3-6m), created by past sea level change and isostatic rebound from the Last Ice Age, along with other deposits including glacial moraine and diatomite beds (Sutherland, 1980<sup>1</sup>).

The toe of coastal landslips, in particular Ben Tianavaig, is where erosion is having the greatest impact, as the removal of sediment here initiates further ground instability. Due to isostatic rebound and resistant geology, coastal erosion is yet to become a significant threat, (Fitton *et al.*, 2017<sup>6</sup>), however, the north-east coast from Uig is designated a Potentially Vulnerable Area for coastal flooding (SEPA, 2016<sup>8</sup>); it includes an SSSI, and two heritage sites. Several properties and areas including Laggan, Largs and Loch Gruinart are identified as being at risk from coastal erosion by 2050 including areas designated as SPA and SSSI.

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

The images of Skye consider, in particular, its cultural heritage assets, including the town of Portree and Duntulm and Dunvegan Castles. Changes that have affected these locations and structures over time are carefully recorded through the art imagery, and can support Historical Environment Records and heritage research for these properties and locations. The images also show the nature of parts of the coastline around the island of Skye and the very little change that has apparently occurred over the intervening period. The 'Dynamic Coast' study (Fitton *et al.*, 2017<sup>6</sup>) noted the resilience of much of the coastal geology within coastal cell 5 (Cape Wrath to Mull of Kintyre) and the limited impacts of erosion except in the vicinity of Kylerhea.

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

1. The generally hard rock coastline and pocket beaches appear to have shown relatively little change over time.
2. There is a good architectural record of historic properties on the island of Skye produced by artists through the nineteenth century in particular, on account of their strategic locations, often in settings of outstanding natural beauty. These artworks make an important contribution towards understanding the cultural heritage of the island.

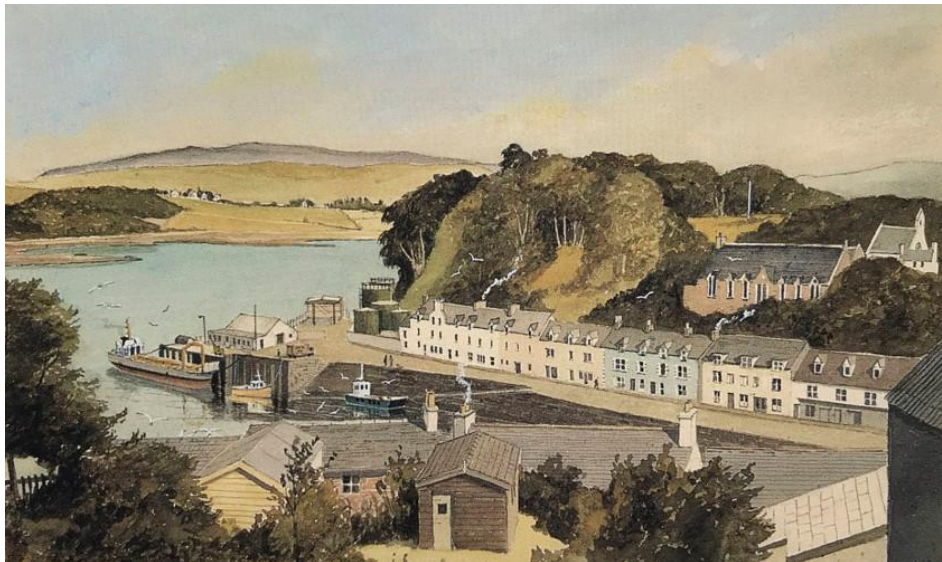
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**Fig. CS8.40.-CS8.42.** This sequence of views shows the development of the town of Portree, which is located on the east coast of the Isle of Skye, overlooking the Sound of Raasay. **Fig. CS8.40. (top)** shows the location of the hamlet of Portree as depicted by William Daniell on his *'Voyage Round Great Britain'* in 1818. The village expanded after the construction of the pier (which Daniell refers to in his account) and this led to the development of the waterfront with the row of cottages illustrated in David Addey's 1996 watercolour (middle). The natural confines of the site and its picturesque location have helped ensure that the architectural heritage of this small town has been largely preserved.



Images courtesy of Fig. CS8.41. David Addey; Fig. CS8.42. Lukas Von Daeniken © 2014/Commons Wikimedia.org.



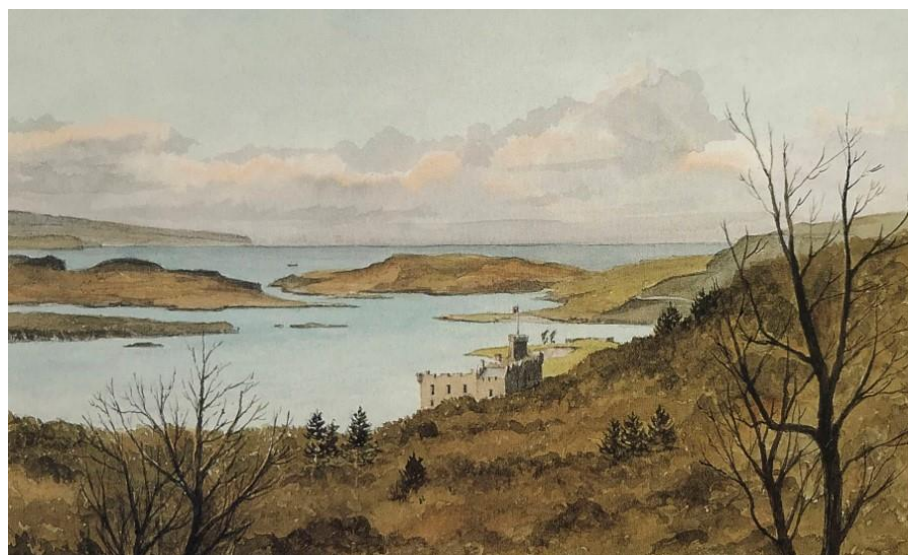




**Fig. CS8.43.-CS8.45.** show views of the coastline in the vicinity of Duntulm Castle, which is located near the northernmost point of the Isle of Skye. Daniell's view (1820) shows the ruins of the castle, which was occupied by the MacDonalds of the Isles until the early eighteenth century. The castle, constructed in such an isolated location, gradually became a ruin and David Addey's watercolour (middle) shows the scene in 1996, this is echoed by the present day view showing the remains of the castle on the headland. Both Daniell's view and the watercolour by David Addey show a pocket beach in the lee of the castle headland, whilst the closer view (bottom) shows the rocky cliffline below the castle from the seaward side, and the proximity of the ruin to the cliff edge.

Images courtesy of Fig. CS8.44. David Addey; Fig. CS8.45. Mael Milscothach © 2015.





**Fig. CS8.46.-CS8.48.** show Dunvegan Castle at the head of Loch Dunvegan on the north-west coast of Skye. The home of the MacLeod chieftains for over 800 years, the castle itself and the adjacent landscape is finely drawn by William Daniell in his view taken in 1820 (top).

The battlemented castle with its flag tower is painted by David Addey (middle) in 1996 from close to Daniell's vantage point, looking out down the Loch towards Dunvegan Head. The present day view is taken from the shoreline, looking up at the property, and shows the rocky, durable nature of the foreshore at the head of the Loch.

Image Courtesy: Fig. CS8.47. David Addey; Fig. CS8.48. John Allan © Geograph.org.uk.