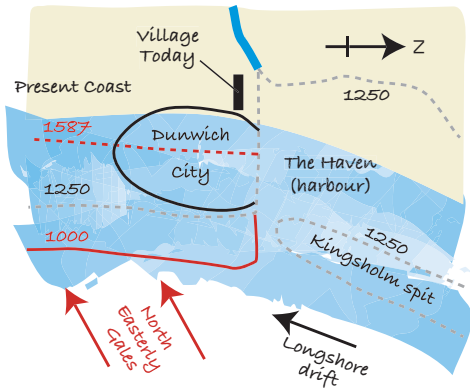


The coastline has retreated over 1 1/2 miles in the last 2,000 years - an average of 1m every year. The map shows how the old medieval city and port have gradually been lost.



The cliffs

The cliffs show part of the Norwich Crag Series deposited about 1.6 million years ago just before the Ice Age, and extending from Orford northwards over much of eastern Suffolk and Norfolk.

Westleton Beds:

The gravels in the upper part of the cliff are of well-rounded flint pebbles, interbedded with sand layers or muddy bands, sometimes iron rich, giving a brown rust colour. Cross bedding is characteristic, and the gravels form a large channel cut into the underlying sands. They were probably deposited in a wave-dominated shoreface environment - a beach or coastal shingle.



Norwich Crag Sands:

Pale white or yellow sands with well-developed current bedding occur below the gravels. Muddy layers are often orange/brown stained. The sands were probably formed in a cold water tidal flat or estuary environment.

The irregular junction between the two horizons is often obscured by talus, but is best seen where recent cliff fall has taken place.

SAFETY

GeoSuffolk takes safety extremely seriously.

- ◆ The cliff is unstable and liable to collapse at any time; keep away from the cliff top and faces, and beware of falling material.
- ◆ Tidal currents are very strong; keep away from the water's edge, particularly where there is loose shingle.
- ◆ Follow the 'countryside code'.
- ◆ Keep to public footpaths and do not climb the cliffs or go onto private property.
- ◆ Be aware of uneven ground and trip hazards.
- ◆ Wear appropriate clothing for the locality and time of year.

Dunwich Forest was planted by the Forestry Commission in 1929
 Minsmere Bird Sanctuary was created by the RSPB in 1948
 Westwood Marshes is a National Nature Reserve
 The National Trust acquired Dunwich Common in 1968
 Dunwich lies within Suffolk Coast & Heaths Area of Outstanding Natural Beauty, designated in 1969
 (for more information visit www.suffolkcoastandheaths.org)



FURTHER INFORMATION

This leaflet is published by GeoSuffolk, with financial support of Natural England and the Suffolk Coast & Heaths AONB Connect Conservation Fund. GeoSuffolk aims to promote understanding and appreciation of Suffolk's Earth Heritage. To find out more, visit our website www.geosuffolk.co.uk. To contact us info@geosuffolk.co.uk or GeoSuffolk, c/o Ipswich Museum, High Street, Ipswich, IP1 3QH

It is suggested that Ordnance Survey sheets 212 and 231 in the 1:25,000 "Explorer" series are used in conjunction with this leaflet.

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Dunwich

The geology of Suffolk's lost city



St. James' Church

The church was built on the site of the former leper hospital in 1830 and converted in 1839 to a gothic style, with the exterior clad in stone. The chancel was added in 1881.

Over 20 different types of building stone can be found in the chancel alone. They are mostly local flint with white Caen limestone. Many of the roughly dressed building stones used are different - red, pink and white granite, black dolerite, basalt and gabbro, white and pink quartzites, gneiss, slate, gritstone, several types of sandstone and limestone, and chalk.

The same rocks are seen in the other church walls, but local septarian nodules from the London Clay of south Suffolk are common with round flint pebbles from the beach. 'Suffolk White' bricks can be seen in the tower.

Most of these building stones are recycled from the leper hospital and buildings lost to the sea. The Caen limestone was imported from France during Norman times, and some stone was ballast used by shipping.

A traditional locally made Suffolk pamment floor can be seen inside the church.



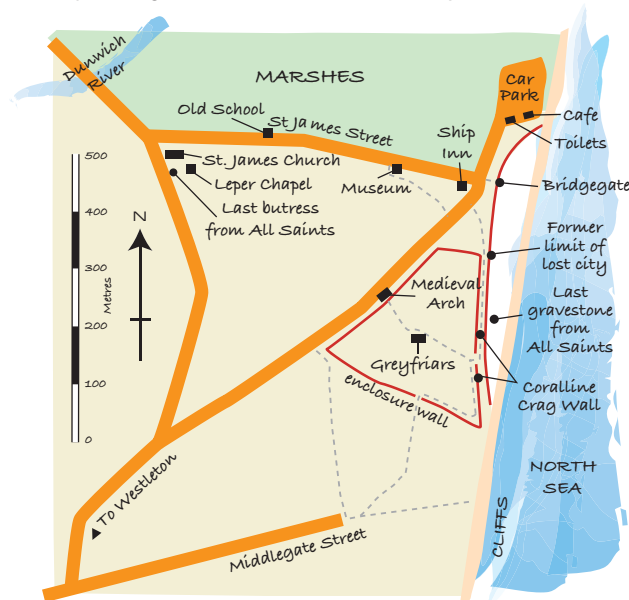
The Leper Chapel

The chapel is all that remains of St. James' Hospital. Founded at the end of the C12th, it was built outside the city itself - lepers were not allowed to live in towns for fear of the disease, which was probably imported during the Crusades. The chapel was last used in 1685. The stylish Norman architecture can still be clearly

seen, with finely carved Caen stone windows and arches contrasting with darker brown septaria from south Suffolk, often badly weathered. Elsewhere, flints and other materials are used, partly for restoration and conservation of the ruin.

DUNWICH - SUFFOLK'S LOST CITY

The city grew as a thriving Saxon settlement and commercial centre around its sheltered port. It further grew rapidly after the Norman Conquest to become one of England's top 10 towns - rich and prosperous, with a huge fleet trading over much of the Continent and Scandinavia. However, coastal erosion caused by storms and floods have inexorably destroyed the medieval city. Only Greyfriars and the Leper Chapel now remain. Although some of the buildings have earlier origins, the present village is largely Victorian. Many of the houses are built of locally made bricks with tiles and pantiles, some disinctively black-glazed. Many of the garden walls are made with flint pebbles.



Greyfriars Monastery

Greyfriars, completed in 1307, was one of East Anglia's most important Franciscan centres. Originally it was founded on an earlier site lost to the sea. It soon became a ruin after the Dissolution. Later buildings on the site used recycled stone and brick.

It was enclosed by a high wall, also using recycled materials. The wall and main arched entry gate contains the same flint, limestone, septaria and many of the 'exotics' seen in St. James' Church - chalk, dolerite, gneiss and sandstone. However, part of the eastern section is composed almost entirely of blocks of Pliocene (3.8 million years old) Coralline Crag, a soft sandy creamy limestone from the Aldeburgh/Orford area.



Dunwich Beach

A steeply sloping shingle beach lies in front of the cliffs. The rounded flint pebbles are supplied by falls of the pebble beds at the top of the cliff. On the beach, this shingle is moved around by the waves in the swash zone. Waves at sea are created by the wind - they are quite small but high frequency at Dunwich because the North Sea is relatively narrow. The breaking waves here usually arrive at a rate of at least 15 per minute. They remove material at the foot of the beach, steepening it. Interaction between the swash and backwash forms 'beach cusps', shown in the photograph, by sorting the mixed sediment into curved shingle banks with sandy areas between.



Cliff Retreat

A combination of soft rocks and exposure to active wave

erosion creates a dynamic coast at Dunwich. The permeable, horizontally bedded strata support steep cliffs and in severe weather conditions storm waves will reach the foot of the cliffs, eroding the sand beds at the base. Undercutting produces instability in the pebble beds above which fall causing the cliff top to recede. The largest waves are produced by storms from a northerly direction so that there is movement of shingle southwards; a process called 'longshore drift'. In this way, Dunwich cliffs supply much of the shingle for Orford Ness, Felixstowe and other beaches to the south.

All Saints Church

The church was the last-standing of Dunwich's medieval parish churches, abandoned after the last service in 1755. The footpath along cliff top passes by the western edge of the grave-yard - only one gravestone is left standing. Bones from the grave-yard can sometimes be seen in the cliff as erosion takes place.

The last buttress from the church now stands in a corner of St. James church-yard. The final part of the tower was lost to the sea in 1922, but the north-west buttress was saved and moved. Of note is the finely dressed 'chequerboard' pattern of limestone and flint used in construction.