

Factsheet

Geology and the Landscape of the North Wessex Downs

The majority of the North Wessex Downs is underlain by chalk resulting in the beautiful gentle rolling topography which is so characteristic of the North Wessex Downs. The area is influenced by geological formations from the Cretaceous, Palaeogene and Quaternary periods.

There is also a direct link between the building materials used in the AONB and the local underlying geology. This is explored in the leaflet ['Diversity in Stone'](#)

Geological History of the North Wessex Downs

Lower Cretaceous (145 – 99 million years ago)

Only the top most part of the Lower Cretaceous (the Gault Clay and the Upper Greensand) are found in the AONB. The Gault Clay is restricted to a narrow band marking the foot of the Downs on the northern margin. This blue-grey mudstone has historically been extracted from the Swindon and Devizes area for brick making. The junction between the Gault Clay and the overlying Upper Greensand is marked on the northern edge of the AONB by a spring line which gave rise to the development of the villages such as Cherhill and Uffington.

The sands and silts of the Upper Greensand are rich in a mineral called glauconite, giving them their green colour. As well as tracing the northern scarp of the AONB the Upper Greensand is also seen at the surface in the Vale of Pewsey, as a result of the uplift of the basin. Towards the top of the Upper Greensand is a bed known as the Malmstone. This is a hard sandstone composed of siliceous spicules held together with a silica rich cement.



Small outcrop of Middle Chalk

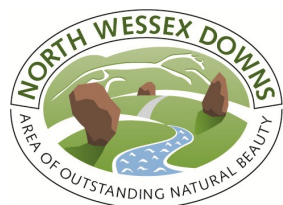
Upper Cretaceous (99 – 65 million years ago, most exposed in AONB)

The Upper Cretaceous chalk dominates the solid geology of the AONB as well as much of its landscape. Although there is around over 200 m thickness of chalk in the AONB it is thought that as much again has been removed from the top as a result of erosion during the last 65 million years or so when the basin was uplifted and tilted.

Chalk is a pure limestone which is 98% calcium carbonate. It is restricted to the Cretaceous period in England and stretches in a sideways u-shape from the Yorkshire Wolds to Devon and across through Kent. At first appearance the chalk can look very unimpressive and uniform throughout. However, it is possible to distinguish a Lower, Middle and Upper Chalk based on variations in lithology and appearance.

Palaeogene (65 – 23 million years ago)

The deposits of the Palaeogene in the North Wessex Downs are unconsolidated sediments which provide no distinctive landscape feature other than the development of neutral to acidic soils leading to the establishment of heath type vegetation and are extremely poorly exposed. The most common of the Palaeogene rocks are the sarsens. These scattered blocks of hard sandstone are one of the most identifiable and well known aspects of the North Wessex Downs geodiversity. They are the remains of the unconsolidated Palaeogene sediments which have been variably cemented by silica.



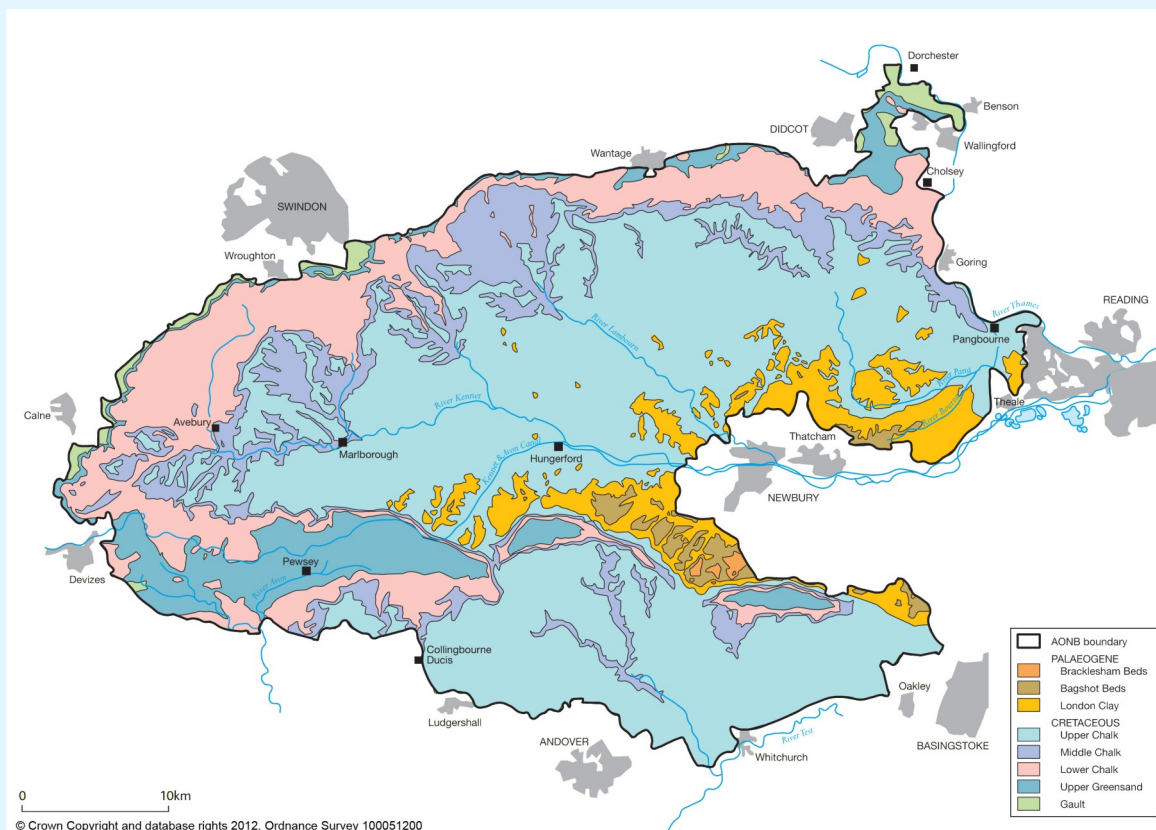


Quaternary Deposits (2 million years ago to Present)

Although much of England was covered by advancing ice at some point during the last 2 million years, there is no evidence in the North Wessex Downs that the ice ever covered this part of southern England. There is evidence that the area suffered periglacial conditions. In the AONB there are three principal types of Quaternary deposit. There are the river terrace deposits, alluvium (modern day river sediments) and a deposit known as clay-with-flints.

It is thought that the river terrace sediments were deposited during the cold periods and not during the warmer interglacial periods of the Quaternary. As ice sheets grew, sea level fell. This rejuvenated rivers and increased their erosive power so they cut deep into the relatively soft bedrock. The terrace sediments are predominantly gravels with sand, though some clays and muds are also preserved. The terrace development reflects the successive cutting of ancient floodplains, the older terraces being the highest ones preserved. Terraces and their sediments have been preserved in all the major modern day river valleys in the AONB. Alluvium is the modern day deposits of rivers. It is mainly silt and clay but can also contain sand and gravels from flood events.

Unlike the terrace deposits and the alluvium, the clay-with-flints is not the result of river channel activity. It is thought more likely to be the remains of the Cretaceous chalk after the affects of intense weathering. It can often be mapped by the presence of woodland particularly in the central and southern parts of the AONB.



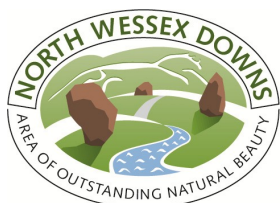
Geological map of the North Wessex Downs.

For further information;

Oxfordshire Geology Trust.
(2007) *Local Geodiversity Action Plan for the North Wessex Downs*. OGT

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