



Kimmeridgian (KIM)

Block Description

Visit <https://jncc.gov.uk/gcr-site-list>, for more information on GCR blocks and sites
For Mesozoic-Tertiary Stratigraphy GCR block descriptions and GCR site lists,
visit <https://jncc.gov.uk/gcr-blocks-mesozoic-tertiary-stratigraphy>

Introduction

The GCR sites selected for this GCR Block represent the British geological record of Earth history from about 154 to 145 million years ago (Ma). This interval is the second part of the Late Jurassic Epoch, which spans from 157 to 140 Ma. The Kimmeridgian strata succeed Oxfordian Age rocks (**see Oxfordian (OXF)**) and is succeeded itself, in the GCR, by the Portlandian to Berriasian strata (**see Portlandian - Berriasian (PTL-BER)**). Rocks that formed during the Late Jurassic Epoch (part of the Jurassic Period) constitute the Upper Jurassic Series (part of the Jurassic System).

Outcrop pattern

On maps showing the solid geology of England, Upper Jurassic rocks crop out in an almost continuous strip from the Dorset coast to the North Yorkshire coast. In Scotland, Upper Jurassic rocks crop out in scattered patches in the islands to the north-west as well as in northern Scotland.

Palaeoenvironment and palaeogeography

Towards the end of the Mid Jurassic Epoch there was a significant marine transgression across much of Britain, drowning the varied shallow marine, fluvial, deltaic, saltmarsh and coastal lagoonal environments that had gone before. Thus, by the beginning of the Oxfordian Age, a shallow shelf sea was established over much of Britain. Sea levels rose throughout the Oxfordian Age and mudrock deposition was widespread, although limestones and sandstones of the 'Corallian' facies (near-shore or shallow water deposits) had developed by the end of early Oxfordian times. Mudrocks are also the predominant lithology of the Kimmeridgian strata, which represents a period of high, global sea level. After the Kimmeridgian there was a major fall in global sea level in Portlandian times, which led to re-emergence of certain land areas.

GCR site selection

For the purposes of site evaluation and selection, the GCR sites can be grouped into five themes or 'networks', reflecting depositional setting largely controlled by deep-seated structural features. The networks are:

- Dorset to Oxford (Wessex Basin, and western margins of the 'London Platform')
- East Midlands (East Midlands Shelf)
- North Yorkshire (Cleveland Basin)
- Scotland (Moray Firth and Hebrides basins)

Although the relatively common invertebrate fossils do not have a separate selection category in the GCR in their own right, the scientific importance of many stratigraphy sites lies in their fossil content. Therefore, some of the GCR sites are selected specifically for their fossil fauna, which facilitates stratal correlation and enables the interpretation of the environments in which the animals lived. Moreover, some sites have international significance because they have yielded fossils that are the 'type' material for a taxonomic group.

Palaeontology, fauna and flora

The traditional means of subdividing the Jurassic System is by means of ammonites, abundant and diverse nektonic cephalopod molluscs that, because of their rapid evolution, prove to be almost ideal 'zone fossils', enabling the correlation and division of the rocks into relative ages by way of a distinct fossil 'signature'.

Invertebrate faunas included abundant bivalve molluscs, such as oysters, smooth terebratulid and ribbed rhynchonellid brachiopods, gastropods (snails), asteroids (starfish), echinoids (sea urchins) and crinoids (sea lilies). Corals became a significant part of the

fauna where there was carbonate sedimentation, along with sponges, bryozoa, echinoids and gastropods. Microscopic organisms included foraminifera, ostracods and phytoplankton (dinoflagellates and coccolithophorid algae).

Lobster- and shrimp-like crustaceans often produced burrows within sediments, preserved as trace fossils.

Belemnites, relatives of the ammonites, were abundant and along with fish were probably the main food of the aquatic reptiles, which were the largest vertebrate animals in the sea. These included plesiosaurs, pliosaurs and marine crocodiles. In addition, in Kimmeridgian times there were pterosaurs, ichthyosaurs and turtles in the Kimmeridgian Age (the British Kimmeridge Clay producing some of the best-preserved Late Jurassic marine reptiles ever found). The fish included both holostean and teleostean bony fishes, and sharks and rays.

On land, dinosaurs had already become established in Mid Jurassic times but in Britain the Upper Jurassic record is fully marine.

In contrast to the manner in which most invertebrate fossils are represented in the GCR, fossils of vertebrates, arthropods (except trilobites) and terrestrial plants do have their own dedicated selection categories, owing to the relative rarity of the fossil material.

See Arthropoda (APD); Jurassic - Cretaceous Reptilia (JUR-CRE-RP); Mesozoic Mammalia (MES-MAM); Mesozoic Palaeobotany (MES-PALBOT); Mesozoic - Tertiary Fish/Amphibia (MZ-TR-FI-A); Palaeoentomology (PALENT).