



Portlandian - Berriasian (PTL-BER)

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,
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Introduction

The GCR sites selected for this GCR Block represent the British 'Portland beds' and 'Purbeck beds' (uppermost Jurassic to Berriasian in age), strata that provide a geological record of Earth history from about 145 to 137 million years ago (Ma). This interval crosses the Jurassic-Cretaceous boundary is the last Age (the Portlandian Age, 146 to 140 million years ago (Ma)) of the Late Jurassic Epoch (which itself spans from 157 to 140 Ma) and the first age (the Berriasian) of the Cretaceous Period (see **Berriasian, Valanginian, Hauterivian, Barremian (BER-BAR)**).

The geology of the local non-marine facies of the 'Wealden' (Early Cretaceous in age) is afforded its own GCR Block (**see Wealden (WDN)**).

In the British area the marine Portland beds (well exposed on the Isles of Portland and Purbeck) were deposited in a triangular area whose corners are Dorset, Oxfordshire and Sussex. They are mostly concealed under younger strata. The Portland Sand lies below the Portland Stone. The predominantly non-marine Purbeck beds, which occur in southern England only (fully exposed on the Isle of Purbeck) are limestones, marls and clays of lacustrine or lagoonal origin, and include palaeosols and marine intercalations.

Palaeoenvironment and palaeogeography

See **Kimmeridgian (KIM)** and **Berriasian, Valanginian, Hauterivian, Barremian (BER-BAR)**

The Jurassic-Cretaceous boundary

The Jurassic-Cretaceous boundary is by definition that between the terminal Jurassic stage and the base of the first Cretaceous stage. The terminal Jurassic stage is again, by definition, the European Portlandian Stage. Eastwards from southwestern and southern Europe to the Crimea and beyond (i.e. in the Tethys biogeographical realm) the boundary lies among marine limestones. In the Boreal realm of Russia, Greenland and Canada, it lies within broken sequences of marine, clastic sediments. In Britain, Greenland, the north Atlantic and northern mainland of Europe there is a variety of latest Portlandian rocks containing related marine faunas.

Across much of Europe (parts of Iberia, Britain, Germany, Denmark, Poland, Jura, Russia), the latest Jurassic to early Cretaceous rocks (Portlandian-Berriasian) are often developed in non-marine 'Purbeck' and 'Wealden' facies. This has obstructed the search for unambiguous correlation and nomenclatural uniformity because the non-marine facies cut across the established marine ammonite-zoned stages of the latest Jurassic and Neocomian Series (see **Berriasian, Valanginian, Hauterivian, Barremian (BER-BAR)**). Additional complications were due to the deeper water facies in Tethys, extreme ammonite provincialism, belated general recognition and separation of the earliest marine Cretaceous strata from the late Jurassic and Valanginian succession and to the aggrandisement of a particular Portlandian facies to rival stage status (Tithonique/Tithonian). Erection of a 'Purbeckian' stage by Brogniart in 1829 further confused matters, but was not adopted by d'Orbigny, who saw the Purbecks as part of the Neocomian Series.

Abandonment of the 'Purbeckian' and acceptance of the 'Portlandian' stage automatically defines the base of the first Cretaceous (Berriasian) stage and greatly simplify nomenclatural matters. In particular, the problem of placing the Jurassic-Cretaceous boundary in the Portland-Purbeck-Wealden interval across northwest Europe is now approaching resolution but awaits only a final consensus on the selection of a basal ammonite zone for the Berriasian stage in Tethys.

GCR site selection

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

See **Kimmeridgian (KIM)** and **Berriasian, Valanginian, Hauterivian, Barremian (BER-BAR)**.