

GEOLOGICAL CONTROLS ON THE FAILURE MECHANISMS WITHIN THE BLACK VEN-SPITTLES LANDSLIP COMPLEX, LYME REGIS, DORSET

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The Black Ven-Spittles landslip complex is one of largest active landslip systems on the south coast of England. It was probably initiated in the Pleistocene in a periglacial climate, but then remained inactive for most of the Holocene. There is map and photographic evidence to show that it has been especially active in the last 100 years and that it is expanding westwards towards the Lyme Regis urban area. The landslip can be divided into two distinct parts; an upper Cretaceous-based part that behaves independently, and an underlying Jurassic-based part that is greatly influenced by movements in the Cretaceous part. The upper landslip is composed of collapsed Gault Formation clay (up to 5 m thick), overlain by a c. 75 m-thick succession of decalcified calcareous sandstones and calcarenites of the Upper Greensand Formation. Below this and extending to the sea, the 100 m-thick Jurassic Charmouth Mudstone Formation crops out in a series of low cliffs, each of which is capped by a thin bed of limestone. During the past 60 years, large-scale failures have occurred in the 'Cretaceous' landslip at less than 10-year intervals, usually after prolonged periods of rain. Each of these has generated large sand-rich debris flows that have poured onto the Charmouth Mudstone Formation outcrop and initiated failures in the more clay-mineral-rich parts of the succession. The more calcareous parts of the Charmouth Mudstone Formation are not prone to failure and form stable ribs within the landslip complex. Large bedding-plane-initiated failures occur infrequently in the Charmouth Mudstone Formation at the seaward end of the complex, beneath The Spittles, where there is a low downslope dip. Two such events have been recorded, in 1908 and 2008.

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