



Regional methods for mapping major faults in areas of uniform low relief, as used in the London Basin, UK

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Most of the London Basin, south-eastern UK, is underlain by the Palaeogene London Clay Formation, comprising a succession of rather uniform marine clay deposits up to 150 m thick, with widespread cover of Quaternary deposits and urban development. Therefore, in this area faults are difficult to delineate (or to detect) by conventional geological surveying methods in the field, and few are shown on the geological maps of the area. However, boreholes and excavations, especially those for civil engineering works, indicate that faults are probably widespread and numerous in the London area.

A representative map of fault distribution and patterns of displacement is a pre-requisite for understanding the tectonic development of a region. Moreover, faulting is an important influence on the design and execution of civil engineering works, and on the hydrogeological characteristics of the ground.

This paper reviews methods currently being used to map faults in the London Basin area. These are: the interpretation of persistent scatterer interferometry (PSI) data from time-series satellite-borne radar measurements; the interpretation of regional geophysical fields (Bouguer gravity anomaly and aeromagnetic), especially in combination with a digital elevation model; and the construction and interpretation of 3D geological models.

Although these methods are generally not as accurate as large-scale geological field surveys, due to the availability of appropriate data in the London Basin they provide the means to recognise and delineate more faults, and with more confidence, than was possible using traditional geological mapping techniques. Together they reveal regional structures arising during Palaeogene crustal extension and subsidence in the North Sea, followed by inversion of a Mesozoic sedimentary basin in the south of the region, probably modified by strike-slip fault motion associated with the relative northward movement of the African Plate and the Alpine orogeny.

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