



## **Constraining the history of vertical surface motions in SE England.**

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While there is considerable focus on the effects of rising sea level what is often not considered are ongoing long term changes in surface topography driven by regional tectonics. The London basin is an area at risk from global sea level rise which has a significant long term history of vertical surface motions. Outcrop and borehole sections taken from the onshore and offshore Cenozoic geological record of the UK are used to plot these regional tectonic vertical motions through time. The Cenozoic geological formations useful to the research are dominantly shallow marine sediments and the successions are thickest in the axial regions of the London and Hampshire basins found in the South East of England. Each successive geological formation through time records a component of the tectonic uplift/subsidence history that spans from the end of the Cretaceous, 65Ma through to the present day. Once this history is better understood it can be used to make predictions of the possible vertical tectonic motion in the future. In order to isolate the tectonic uplift or subsidence in a basin and the magnitude of the basement movement, the water depth at the time of deposition, the relative sea-level and the compaction history for the sediments of each formation needs to be constrained. Water depth has been determined so far using a variety of sedimentological, palaeontological and sequence stratigraphic evidence. Palaeo-bathymetry maps have then been contoured from the point data providing the relative palaeo-coastline for each geological formation. The relative sea-level curve will be used from previous work. The third parameter is the decompaction of a formation from its preserved thickness at the present day, to its water saturated and unconsolidated state at the time of deposition. Resolving these parameters and producing a comprehensive burial history for each geological formation in the UK will allow the final isolation of the UK tectonic subsidence history. Comparing the outcome with existing research on UK Cenozoic uplift patterns will enable us to deduce the dominant tectonic controls on surface elevation change in SE England and its relationship to the major events effecting NW Europe.