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The measurement and interpretation of current changes in land levels in London and along the Thames estuary

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Long term planning for flood risk management in coastal and estuarine areas requires timely and reliable information on changes in land and sea levels. This paper details research carried out to obtain estimates of current changes in land level, on the scale of millimetres per year, in London and along the Thames Estuary. Such measurements represent a major challenge and the research used data from 1997 to 2005 from three complementary monitoring techniques: the Global Positioning System (GPS); Absolute Gravimetry (AG); and Persistent Scatterer Interferometry (PSI).

The research was carried out as a regional study within the framework of a national study. For the national study, continuous GPS (CGPS) stations were established at ten tide gauges around the coast of Great Britain and AG measurements were made at three of these. For the regional study, episodic GPS (EGPS) data from a network of stations, and PSI data for hundreds of thousands of persistent scatterer (PS) points, in London have been analysed and the changes in land level interpreted using various geoscience data sets.

In this paper we will describe how we have produced a detailed, high resolution map of current changes in land levels for London, highlight a series of interesting conclu-

sions where the measured changes correlate with specific subsurface causes of ground movement, and show how this map has been used for a new assessment of the changes in sea level relative to the land along the Thames estuary.