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Constraining the evolution of the Irish ice sheet using a new sea-level data base for Ireland

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The British Isles have been the focus of a number of recent modelling studies owing to the existence of a high quality sea-level data set for this region and the suitability of the data for constraining shallow Earth viscosity structure, local to regional ice sheet histories and the magnitude/timing of global melt water signals [e.g. *Shennan et al., Quat. Sci. Rev., 21*, 2002]. Until recently, the paucity of both glaciological and relative sea-level data from Ireland has meant that, with the exception of the efforts *of* Lambeck [*J. Geol. Soc. London, 153*,1996] and Lambeck & Purcell [*J. Quat. Sci., 16*, 2001], previous glacial isostatic adjustment (GIA) modelling studies of the British Isles region have tended to concentrate on reconstructing ice cover over Britain. However, we have recently compiled a new, quality-assessed, sea-level database for Ireland and have retrieved new data from Ireland's west coast, some of which are of early Holocene age and therefore provide powerful constraints on estimates of local to regional ice thickness. In this paper, we employ our new data set to constrain models of Irish ice sheet evolution prior to and following the LGM.

In particular, we take some of the results proposed in a number of glaciological studies, which have significantly augmented our understanding of the spatial and temporal evolution of late Devensian ice cover over Ireland [e.g. *McCabe et al., Quat. Sci. Rev., 24, 2005; Clark and Meehan, J. Quat. Sci., 16, 2001; O'Cofaigh and Evans, J. Quat. Sci., 16*, 2001], and perform sensitivity tests to determine which aspects of the ice history can be constrained using our new sea-level database. Our preliminary findings show that: (1) short term ice (re)advances and/or spatially localized variations in ice extent/thickness have a negligible glacio-isostatic sea-level signature; (2) existing GIA ice model reconstructions for Ireland are inconsistent with some of the new glaciological and relative sea-level data, which support the suggestion that LGM ice thickness was generally greater than previously envisaged for this region.