Geophysical Research Abstracts
Vol. 14, EGU2012-1628, 2012
EGU General Assembly 2012

Topographic and stratigraphic expression of submerged shorelines in the Irish Sea

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Differential isostatic depression during ice-loading and subsequent rebound are predicted to be reflected in a time-transgressive lowstand of sea level around the British Isles. The deepest and lowest shorelines are expected in the south where isostatic influences were reduced compared to the areas adjacent to ice centres in the north. A series of seabed investigations using multibeam bathymetry accompanied by boomer and pinger shallow seismic profiling was conducted at a series of sites determined to have high potential for preservation of lowstand shorelines. The selection criteria included high rates of sediment supply, likely or proven presence of incised fluvial valleys and/or proven presence of terrestrial deposits. Since the likely lowstand shoreline depths were only vaguely constrained before the survey, areas where the seabed was steeply sloping were selected preferentially to reduce survey times.

The results from Bantry Bay, Waterford, Cardigan Bay, offshore Louth, Isle of Man, South County Down and Belfast Lough all yielded markedly different types of shoreline indicator that reflect the geological setting at each site. Former sea levels were indicated variously on the seafloor by wave-cut platforms and associated cliffs in bedrock, planation surfaces on drumlins, incised valley termini and the seaward limit of the transgressive unconformity. These enable the former sea level to be identified to a vertical resolution of several metres. Subsequent coring of targets in 2012 will be used to more tightly constrain vertical elevations of former shorelines and acquire material for biostratigraphical analysis and dating.