REGIONAL CLIMATIC *VERSUS* LOCAL CONTROLS ON PERIGLACIAL SLOPE DEPOSITION: A CASE STUDY FROM WEST CORNWALL

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Diamictic breccias, interpreted as slope deposits formed under Quaternary cold-climate conditions, are described from St Loy, west Cornwall coast. These deposits (8 m thick) overlie a granite platform that varies from strongly weathered to cleanly planated. Within the slope deposits are dated organic-rich silts that were formed under a cold-climate, boulder clusters (interpreted as a raised beach), and large bedrock slabs (interpreted as a rockfall deposit). The range of sediments and structures observed at St Loy demonstrates the interplay between regional climatic and local basinal controls on slope deposition, and the importance of the underlying granite bedrock in sediment generation/supply.

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INTRODUCTION

In contrast with much of the British Isles, south-west England was likely not glaciated during the Quaternary era (last 1.8 Ma) (Stephens, 1970; Bowen *et al.*, 1986; Scourse, 1996; Cullingford, 1998; Clark *et al.*, 2004). Although, therefore, unaffected directly by the sediment generation and erosion processes associated with glacial action, this also meant that it was unaffected by the presence of regional stratigraphic unconformities, formed during ice advance, which have the unfortunate effect of truncating the sediment record (Croot and Griffiths, 2001). South-west England is therefore of interest because its non-glacigenic Quaternary record potentially extends back farther in time than in other parts of the British Isles, and may therefore provide a more detailed record of climatic and environmental changes over (parts of) this time interval (Bates *et al.*, 2003). These sediments also have a generally high preservation potential due both to the absence of glacial erosion, and the presence of rock-bounded basins (often related to river incision, particularly in lowland areas) which provide ideal sediment depocentres (Cullingford, 1998; Croot and Griffiths, 2001; Bates *et al.*, 2003).

Quaternary-age sediments found on these coastal lowlands and in rock-bounded basins include wind-blown, beach and shallow-marine sands, beach gravels, and cold-climate (likely periglacial) slope deposits, generically termed 'head' (Harris, 1987, 1998; Ballantyne and Harris, 1994). In south-west England, the bedrock platforms upon which all these sediments are built likely extend back to at least the interglacial of marine oxygen isotope stage 9 at *c.* 340 kyr BP (Bowen, 1994; Scourse and Furze, 2001; Bates *et al.*, 2003). Although the overlying sediments, therefore, potentially cover a wide time span, they are also likely characterised by significant depositional hiatuses and erosional truncations. These limit the potential for entire sediment sequences to be either correlated between different locations, or to be a continuous record of climate, although parts of these sedimentary sequences may be useful lithostratigraphically.

Aims

This paper aims to investigate the processes of slope sediment deposition, under cold-climate (periglacial) conditions, at St Loy (west Cornwall coast). In detail, this paper (1) describes the Quaternary-age sediments exposed at St Loy; (2) considers the major processes contributing to sediment deposition at this site; and (3) evaluates the relative roles of local versus regional (climate) controls on Quaternary slope sediment activity and formation of the slope sediment record.

DESCRIPTION OF FIELD EVIDENCE FROM ST LOY

At St Loy (grid reference SW 1425 0231), located 8 km west of Penzance (Figure 1), a boulder beach overlying a weathered and eroded Land's End Granite platform is backed by cliffs (< 8 m high) mainly comprising Quaternary slope deposits (Scourse, 1987). The sediments at this site have been previously described by a number of workers, most recently by Scourse (1996) who identified a range of slope deposits, which are interbedded with organic and non-organic sandy silts. Four flat-lying sediment units are laterally continuous across this site, and are shown in Figure 2.

In the western part of St Loy's Cove (Figure 1), the surface of the granite platform is smoothly eroded with shore-normal furrows developed along bedrock joints (Figure 3). The platform surface is overlain sharply by 1 m of sub- to well-rounded local granite and exotic cobbles (< 10 cm diameter) which form a poorly sorted and massive diamicton (unit 1). The diamicton varies from clast-supported to sandy matrix-supported. Occasionally clasts are arranged into flat and discontinuous lines, and in some locations thin, sandy interbeds are present. These interbeds have a wavy geometry and pinch out laterally. Some clast-poor areas within the diamicton, often located beneath or adjacent to larger clasts, are composed of sorted, massive granules. Unit 2 is a boulder-rich facies (0.2-1.0 m thick) comprising sub- to well-rounded local granite clasts (< 1 m diameter). The unit varies in thickness laterally, depending on the concentration and size of clasts contained within it, and usually has a sharp and planar lower boundary and a more diffuse upper boundary. The clasts within the unit are usually touching, arranged in clusters, or may be supported by a matrix comprised of granules to pebbles. Some adjacent clasts are also arranged such that their upper surfaces form a flat pavement (Figure 4). Occasionally, clasts are separated by a moderately well-sorted coarse sand to granule matrix which drapes the upper surface of some clasts.