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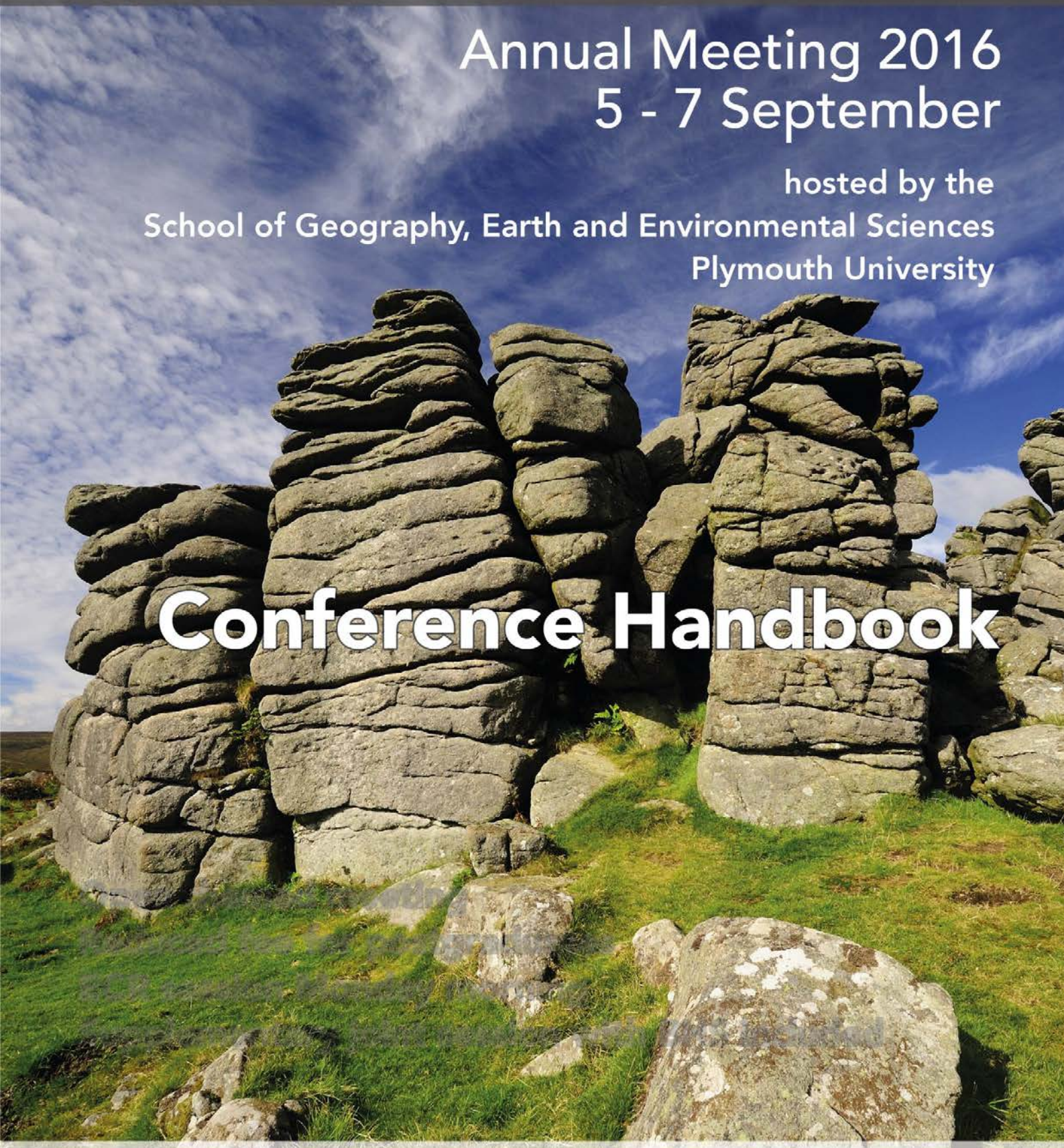

Conference Handbook

GEOMORPHOLOGY WITH PLYMOUTH UNIVERSITY

BSG British Society for Geomorphology

Alluvial fans as recorders of volcanic island denudation

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We report remote sensing, field survey and geochronological results of Quaternary alluvial fan development on Santo Antão in the arid Cape Verde archipelago, offshore West Africa. Fans are large coastal coalescent forms restricted to southern edifice flanks. The largest fan (6km long, ~4km wide, area ~10km2) comprises a single surface (Qf0). Cosmogenic 3He dating of surface boulders yields age groupings of ~160-50ka (distal) and 20-10ka (proximal). Qf0 dissection exposes poorly sorted fluvial fan sediments interbedded with (undated) lavas and an Argon dated tephra (~193ka). Boreholes reveal a 180m fan sediment-lava sequence suggesting prolonged fan sedimentation and volcanic activity. A single active channel dissects the Qf0 surface from the coast (~4m deep, ~ 200m wide in distal fan; ~60m deep, ~10m wide in proximal fan), inland into a backfilled flank margin catchment area (30km2; 1500m relief) with incision increasing to ~110m. Catchment infill comprises inset fill terraces and lava flow channel infilling/damming. The steep volcanic edifice morphology restricts coastal fan development, inhibiting accommodation space and enhancing erosion through base-level fluctuations when fans do form. Flank collapses modify the steep edifice margins, creating space, sediment supply and drainage routing conducive for fan building. Volcanic hydrothermal alteration is important for island morphology where altered rocks can be readily exploited by fluvial erosion, e.g. south island coalescent fan catchments. These fans may occupy former flank collapses based upon edifice morphology and offshore bathymetry. Sedimentation is long lived (pre-Middle Pleistocene) with the Late Pleistocene Qf0 surface abandonment-incision linked to climate-related sediment supply and base-level change.