

**AAPG Annual Convention  
Salt Lake City, Utah  
May 11-14, 2003**

Rufus Brunt<sup>1</sup>, William McCaffrey<sup>1</sup>, Lawrence Amy<sup>2</sup>, Ben Kneller<sup>3</sup> (1) Leeds University, Leeds, United Kingdom  
(2) Bristol University, Bristol, United Kingdom (3) University of California, Santa Barbara, CA

**The Effects of Ponding Infill on the Spatial Distribution of Turbidite Grainsize: Examples from the Laboratory and the Peira Cava Sub Basin of Southeast France**

In many basinal settings, turbidity currents are inferred to fill discrete mini-basins that are linked streamwise. As the upstream basin is filled with sediment, progressively more overspill is directed into the lower basin. Because depositional turbidity currents are vertically stratified in terms of density, grain concentration and grainsize, it might be expected that vertical trends in mean grainsize, and sand to shale ratio might be produced in both the upstream and downstream basins during the fill to bypass transition.

An experimental program was conducted to assess spatial trends in sediment character developed within a pair of linked basins. The model consisted of a 45cm wide channel, 152cm in length with two obstructing sills, the first at 75cm and the second at 150cm. The experimental flows consisted of a suspension of 10-50  $\mu$ m glass beads with a 5% density excess over the ambient. Three sets of experiments were conducted, using varying first sill heights, while the second sill remained fixed. The first set of experiments investigated flow velocity, concentration and grainsize stratification in a basin obstructed only by the second sill. In the second set individual flows were obstructed by a fixed height first sill, while flow stratification was measured. Both sills were fixed at 70mm for the third set, while repeat flows, with each flow running over the deposit of its predecessor/s were generated. Sampling along the length of the composite deposit allowed the mapping of systematic changes in grainsize in both horizontal and vertical dimensions. In a field scale study, the relationship is expressed as the ratio of turbidite sand to turbidite mud in a concomitant, and complimentary, relationship between the upstream and downstream basins.