Piret Plink- Björklund\(^1\), Ron Steel\(^2\), Bryn Clark\(^2\), Anna Pontén\(^1\), Louise Sjögren\(^1\) (1) Göteborg University, Gothenburg, Sweden (2) University of Wyoming, Laramie, WY

Hyperpycnal Flow Turbidites as an Indicator for Sequence Boundary in Slope Turbidite Systems of Spitsbergen Central Basin

There are several mechanisms to generate sustained flow turbidites in a basin. In Eocene Central Basin of Spitsbergen, direct river input by hyperpycnal flows was responsible for generating sustained turbidity flows, since (1) shelf-edge delta distributaries feed directly into upper-slope channels; (2) great volumes of fresh river water lowered the salinity in the small basin; (3) tectonically active source area provided high erosion rates; (4) rivers that entered the basin were small and highly sediment-laden; (5) narrow shelf enabled hyperpycnal flows to reach the shelf edge; (6) systematic progradation of slope turbidite systems during the lowstands indicates continuous sediment input; (7) turbidity currents feeding the slope were very weakly erosive and non-ignitive.

Surge-type turbidites also occur, but in stratigraphically lower parts of the seaward-stepping clinoform complexes, whereas sustained flow turbidites are frequent close to the maximum regression. In localities where feeder systems are preserved on the shelf edge, the transition from surge-type flows to sustained flows correlates into an interval where shelf deltas reached the shelf edge and stepped down onto the upper slope, indicating a relative sea-level fall. The sequence boundary occurs at the top of each of the seaward-stepping clinoform complexes. Rivers can go hyperpycnal independent of the sea-level position, but such flows die quickly if they do not debauch onto a slope. Thus, hyperpycnal flows have a much greater potential to reach the deep-water slope or basin floor during sea-level lowstands, when the rivers/distributary channels make it to the shelf edge and the flows are delivered directly onto a slope.