SLURRY FLOW DEPOSITS FROM THE TYEE FORMATION, OR: PROCESS SEDIMENTOLOGY, MUD CHARACTERIZATION, AND IMPLICATIONS FOR FLOW EVOLUTION

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Submarine sediment-gravity flows are among the most volumetrically significant, yet least understood sediment transport agents on earth because they occur in inaccessible deep-water settings and have scales that make them difficult to model in laboratory systems. Slurry flows are anomalous types of sediment gravity flow that exhibit components of both turbidity currents and debris flows. The deposits of these flows typically contain a portion of mud-poor, turbidite sandstone and a portion of mud-rich, matrix supported debrite. These types of deposits are not well explained in terms of classical depositional models but they are now frequently recognized in many deep-water sequences. This project aims to characterize the bedding styles, stacking patterns, depositional environments, and basinal context of slurry flow deposits from understudied sedimentary sequences of the Tyee Formation, Oregon. This will involve analyzing the mud composition using XRD of the matrix mud, mud clasts, and mud caps of both slurry flow deposits and turbidites. Because the composition of mud often changes from shallow to deep environments, this data may help to illuminate some of the key issues surrounding where the mud in a slurry flow is sourced from and how it may reflect a different process of flow evolution from turbidity currents. Slurry flow deposits exhibit much poorer reservoir quality relative to turbidites and this project aims to develop a more thorough understanding of these flows such that the location and architecture of sequences rich in slurry beds may be better predicted.