

## **Thickness and Facies Trends Along Depositional Dip in Turbidite Sand Sheets (Cerro Toro Formation, Magallanes Basin, Chile; and Cingoz Formation, Adana Basin, Turkey) – Any Implication for Allogenic Cycles?**

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### **ABSTRACT**

Attempts have been made in the past to link thickening and coarsening upward turbidite sequences to progradation, and thinning and fining upward to retrogradation. However, previous studies may have neglected the following factors: i, if paleocurrent directions in a given succession change significantly (for example due to multiple sources), thickness and facies cycles may be not suitable as indicators of allogenic cycles; ii, erosional feature, should be regarded as an independent facies element as important as grain size change, but most previous studies have ignored it. Their influence on thickness and facies trend may be strong if the section is intensely amalgamated; iii, confinement; if turbidity currents spread out and fill the morphologic low, vertical stacking, thickness and facies trend may have a simple and positive correlation to progradation, aggradation and retrogradation. If turbidity currents experience more compensational process, 1D successions may show complex correlation to progradation, aggradation and retrogradation. Thinning and fining upward may also have three explanations at least: i, retrogradation. There are various possible reasons, e.g. sea level change or retrogressive sediment supply; ii, sediment bypass. Commonly proximal deposits showing bypass facies, but actually it may be hard to know which is the dominant factor of flow efficiency; iii, abandonment. Abandonment could be treated as a special case of retrogradation.

In this study, we consider all the factors above and test thickness and facies trends along depositional dip direction in turbidite sand sheet system of a foreland basin. In addition to traditional analysis of descriptive statistics, also adopt we runs tests and Markov chain analysis for beds/packets (one/several depositional events respectively) or sandstones, within correlated units. The results show that in more proximal parts asymmetrical trends of thickness are common, while in distal parts more symmetrical or random trends of thickness are prevalent. The reason for this result may be related to the degree of confinement.