# An Experimental Study of Clinoform Morphology

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A clinoform is a seaward-dipping surface of a prograding sediment body that consists of a gently dipping topset, a steeply dipping foreset, and a gently dipping bottomset. The topset consists of fluvial and subaqueous environments coupled at the shoreline. Clinoforms are ubiquitous in modern depositional systems and are the fundamental constructional units of stratigraphic sequences. Previous studies have provided considerable insight into the large-scale response of clinoforms to changes in sea level, sediment supply, and subsidence. However, we have a relatively poor understanding of how basin hydrodynamics control clinoform morphology. The results of this study will improve our ability to infer basin hydrodynamics from the rock record.

I will conduct a series of carefully scaled physical experiments to quantify how the interplay of sediment and water supply, waves, and currents controls clinoform geometry, particularly the width of the subaqueous topset and the partitioning of sediment between fluvial and shallow-marine environments.

I will conduct my experiments in a 12-m long, glass walled flume located at the University of Minnesota's St. Anthony Falls Laboratory. A steady input of water and sand to one end of the flume will drive overall clinoform progradation. I will first quantify the effects on clinoform morphology of waves of various amplitudes and periods. In a second set of experiments, I will superimpose a seaward-directed current on the wave field and analyze the effects on clinoform geometry. In order to quantify the evolution of clinoform geometry during progradation, I will document all experiments with digital video and photographs.