

The Influence of Sediment Heterogeneity on Coastal Hydrodynamics

Holland, K T., Kaihatu, J M and Keen, T R

Although recent advances in data collection and numerical modeling have greatly extended our skill in predicting coastal hydrodynamic and morphodynamic processes, the influence of mixed sediments or temporally varying sediment characteristics on coastal dynamics has largely been ignored. Here we hypothesize that the influence of sediment heterogeneity is not only significant, but also extensive, as heterogeneous sedimentary environments comprise the majority of the world's non-rocky coastal regions. Observations from a variety of locales are presented to demonstrate the impact of sediment heterogeneity on coastal hydrodynamics and to emphasize how understanding coastal hydrodynamic processes in heterogeneous sedimentary systems requires alteration of traditional approaches. Examples shown include hydrodynamic variations relating to poorly sorted, patchy, and dynamic sediment heterogeneity that greatly differ from observations within more uniform (either sand or mud) environments. We outline a five-year research program that utilizes new observational capabilities designed to investigate the influence of sediment heterogeneity on coastal dynamics with an ultimate goal of extending our predictive capability to a more global extent.