This study evaluated the spatial and temporal changes in beach morphology by analyzing the grain size distribution and the effect of the hydrodynamic conditions on the beach showing shoreline instability. Ten transects, from which morphological and hydrodynamic parameters were measured, were selected along the Nyali-Bamburi shoreline perpendicular to the shore. Morphological parameters such as beach orientation, beach width, and beach slopes were determined and sediment samples obtained during low tide. Wave energy was calculated from wave heights measured at the breaker point using a graduated staff, whereas swash and backwash velocities were determined at midbeach during high tide. Sediment samples were dried and sieved using an automatic shaker for grain size analysis using the graphical method. The study showed that beach morphology was rapidly changing with time along the shoreline. The changes were mostly attributed to wave and sediment characteristics. It was also established that steep-sloping beaches were associated with strong wave energy and coarse sediments, whereas gently-sloping beaches were of fine, well-sorted, and positively-skewed sediments, with relatively less strong waves. Steep beaches seem to be relatively short in width. There was a remarkable retreat of the shoreline.

ADDITIONAL INDEX WORDS: Beach sediments, grain size analysis, beach morphology, hydrodynamics, longshore drift, coastal erosion, shoreline instability