

## **ABSTRACT**

**Most sediment chosen for southeast Florida beach renourishment projects displays unsuitable grain size, durability, and hydrodynamic behavior for a beach setting. As a result, the coral and hardbottom communities lying on the adjacent narrow shelf are being stressed by increased sediment turbidity, siltation, and smothering. Historical and proposed renourishment sands derived from dredging on the adjacent shelf contain excessive amounts of fine sand and silt too small to remain on the beach, resulting in persistent long-term suspension-transport release to nearshore waters. Most shelf-derived renourishment sands contain much less durable carbonate skeletal material than the natural beach sands, when tested in a tumbling barrel designed to reproduce natural beach abrasion. In addition, carbonate skeletal grains display hydrodynamic behavior of grain sizes smaller than their sieve sizes when settled in a vertical accumulation tube. When used for renourishment, a higher percentage of these sands will not remain on the beach. Durability and wet settling analyses must be utilized in evaluating sediment for possible placement on a beach.**

**Failure to use sand of proper size, behavior, and durability in beach-fill projects results in decreased project life and long-term degradation of the adjacent sandy and hardbottom communities and coral reefs.**