Longterm Nearshore Sedimentation on a Renourished Beach: Hancock County, Mississippi

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Mississippi's mainland coastal defense scheme is heavily dependent on wholly artificial beaches and their periodic renourishment. Consequently, nearshore sediment volumes and projected beach life spans constitute important information for local and state planners. Quantifying volumetric change and shoreline retreat values is an important first step; however, the unique aspects of fill deposition also provide an opportunity to clarify sediment transport and document changes caused by borrow pits. A combination of vibracores and yearly beach profiles was used to document short- and long-term sedimentation patterns and describe Pleistocene units along the continuously renourished Hancock County Beach.

Naturally, using fill as a tracer is made easier when "unique" sediment is used. At the study site the sediments were dredged from a local offshore borrow pit; and, although they were not unique, trace fossils, sediments filling them, textural trends, and faint contacts seen in vibracores helped distinguish discrete sedimentary sequences. In some cases, however, differences were subtle enough to raise questions as to their origins. To increase confidence in Fill/Holocene contacts an 'if then' logic using both profile and sediment data was employed. Short-term depositional patterns from profiles were used to validate or reject unit contacts as Fill/Holocene boundaries based on a set of logical rules.

Long-term results agree well with documented renourishment projects and suggest that much of the sediment pumped onto the subaerial beach is now resident on the nearshore platform. Use of a nearshore sediment source for the latest renourishment has caused the onset of erosion landward of its borrow pit; previously this area was dominated by deposition. Taken in total, vertical growth of the nearshore produced by continuous renourishment should provide added wave protection. Additionally, the width of the nearshore platform and, thus, its ability to store sediment is controlled largely by the lithology and morphology of underlying Pleistocene units.