Geotextile TUBES

slow erosion and stabilize the beach

After years of pummeling by hurricanes and other storms, plus a history of erosion problems, it appears that a geotextile tubing system will help sustain the beaches at Stump Pass in Florida. Stump Pass is a scenic stretch of sand beach—a natural inlet on the south end of Manasota Key—that connects the Gulf of Mexico and Lemon Bay near Englewood, Fla. It is part of Stump Pass Beach State Park in Charlotte County in the southwestern part of the state.

History

In 1998, an $11 million dredging and beach replenishment project commenced at Stump Pass. The ambitious erosion-control project included the nourishment of three miles of badly eroding beaches adjacent to Stump Pass. All told, more than 800,000 $yd.^3$ of sand were pumped onto surrounding beaches, making the pass 150 ft. wide and at least 9 ft. deep.

But the sand would continually shift. Nautical markers became misleading. And boaters who weren't familiar with the sandbars often went aground.

In June 2004 a team of beach restoration engineers gathered just north of Stump Pass to measure beach profiles, wind exposure, tide patterns, and current flows. Using the data, the team embarked on the assembly of a beach erosion-control system that was a first-of-its-kind in the United States. The engineers, working with Florida's Department of Environmental Protection (DEP) and with Charlotte County—designed an eco-friendly system of submerged, low-profile, sand-filled geotextile tubes intended to reduce sand drift into the channel and to stabilize the eroding portion of the beach.

To slow the annual rate of sand filling into the channel, the experimental system tubes create sand-deposit zones and reduce cross-shore sand movement. The tubes, which run from the dunes of Stump Pass Beach State Park to a spot 350 ft. into the Gulf, are buried under the beach or submerged under water, so only a portion can be seen. Since June, when three of six tubes were initially installed, 20 ft. of shoreline has been restored.

The tubes were manufactured using geotextiles. The external armor fabric was matched specifically for the sand color. They range from 150 to 375 ft. long.

Project: Stump Pass Beach State Park
Location: Stump Pass, Florida
Date: 2004
Geosynthetics: Geotextile tubes

Above: Treated beachfront at Stump Pass after the installation. The experimental system of tubes creates sand-deposit zones and cuts down on cross-shore sand movement. Thus, it slows the rate that Stump Pass channel fills with sand.

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