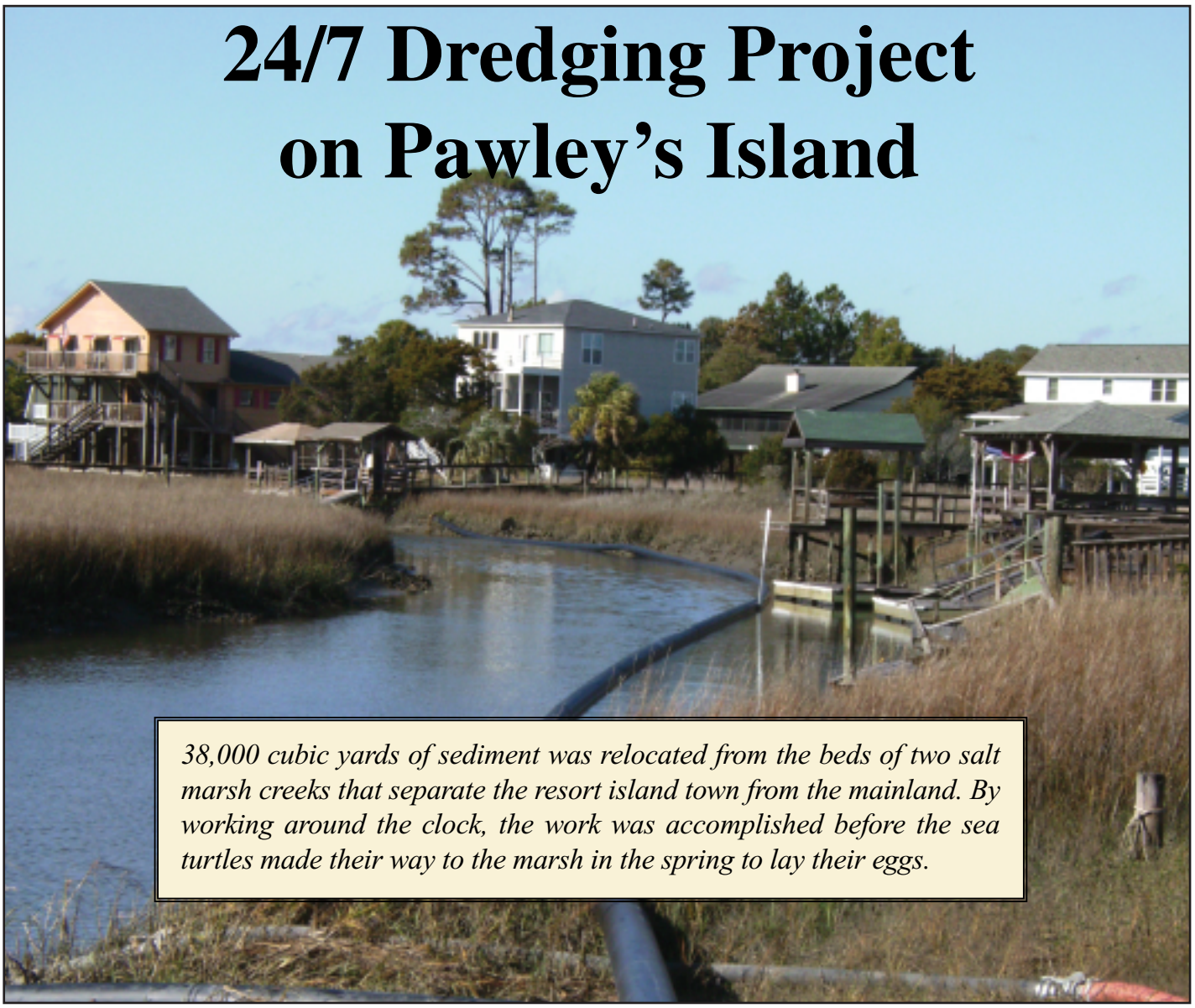
24/7 Dredging Project on Pawley's Island



38,000 cubic yards of sediment was relocated from the beds of two salt marsh creeks that separate the resort island town from the mainland. By working around the clock, the work was accomplished before the sea turtles made their way to the marsh in the spring to lay their eggs.

The resort town of Pawley's Island, North Carolina is separated from the mainland by two salt marsh creeks.

THOSE in the industry know all too well that dredging is no business for the weak-of-heart or the ill-equipped, and a project this year in Pawley's Island, South Carolina is no exception. After over ten years of struggling to receive the green light from government and environmental organizations to deepen the waterways that separate the island from the mainland, the town finally launched the project last November. It relocated 38,000 cubic yards of sediment from the beds of two salt marsh creeks that separate the resort island town from the mainland, to the two major recreational beaches at either end of the island.

And they did it all before the sea turtle population returned this spring to nest their eggs.

The creek beds, which have never been dredged, were reaching critical heights that would impact the sensitive estuary habitat and infringe on residents' ability to use the creeks for recreational uses like paddling, fishing and crabbing, according to town mayor, Bill Otis. He feels the creeks and the wildlife habitat they provide form a big part of Pawley's Island's personality and as such, fought hard to get this project under way despite some tough timelines. "This whole project is quite an achievement, really," said Otis. "It's a significant operation and it all had to take place, start to finish, during the sea turtle's off season."

Sea turtles come to the marsh in the spring to lay their eggs and stay through the summer, heading back to sea with their offspring the following fall, giving the town less than six months to complete the job.

These stringent time constraints meant that the dredging firm contracted to carry out the project, Retention Pond Services, Inc. of Wilmington, North Carolina, had to work around the clock from when they started in November 2007 to get the job done.

"We had two crews of five people working alternate 12-hour shifts seven days a week, and was like that the entire project," explained Jack Sharp, the construction manager on the project. "This kind of 24-hour operation taxes not only

the human resources, but the equipment as well, and when you throw in the unexpected, the stresses only increase", he added.

In this case the unexpected included challenges like the discovery that the sediment in the creek beds was riddled with large debris left behind by the numerous severe storms that hit this area on a regular basis, like 1989's hurricane Hugo. As well they discovered an abundance of shells that are not ideal for beach sand. When they started the hydraulic dredging project, Retention Pond Services was using an 8-foot wide auger cutting head on a dredge manufactured by Montana-based SRS Crisafulli and a six-inch sludge pump. They had used this machine in the past on a couple of projects – to dredge aquatic weeds and some sediment from two ponds owned by New Hanover County in Arilie Gardens and also to remove construction silt and sediment from a neighbor hood lake in Durham, NC where a developer had not protected against erosion. But for this particular application, due to the density of the in-situ material, this combination proved ineffective. "As soon as we discovered the large debris and shell content we knew there was no way the first machine was going to be able to do the job," said Sharp.

They quickly switched to a new cutter-suction dredge -- the Ellicott 8-inch Swinging Dragon -- which is capable of more aggressive digging and higher pumping volumes. It is equipped with a swinging ladder and a serrated tooth cutter head and can provide downward digging pressure with a hydraulic cylinder. Unlike its predecessor, the serrated cutter head was capable of agitating the virgin soil, comprised of sand, shell, mud, and stone as well as large debris, on the bottom of the waterway and the pump, a larger Metso-Mineral 8-inch pump, sucked the dirt up as it mixed with water. The process was aided by the addition of a booster pump to help transport the sand through the pipeline. This slurry was transported through an HDPE pipeline to a dewatering area -- in this case one of two beaches -- where the water and solid were separated so the sand would fall out of suspension and the water go into the ocean.

Background: The dewatering area where sediment that had been suspended in the slurry added sand to the eroding beachfront. Insets: The crew fused over 12,000 feet of HDPE pipe using a Connectra 314 fusion machine. The slurry collected from the salt marsh is deposited in the dewatering area.

The initial dredge wasn't the only machine to feel the effects of the challenging 24/7 job. In fact, only two of the ten of machines used on the project did not require repairs or replacing. One of those two machines was the high performance Connectra 314 fusion machine.

Alan Berry is not surprised. His firm, Georgia Underground, provided the pipe, the fusion machine and the training required to operate it. "We had to fuse together over twelve thousand feet of pipe on this project," said Berry, "and that machine did not let us down, not once.

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The Ellicott cutter-suction dredge.

Which is very welcome, I have to tell you, on a project like this."

The crew used HDPE SDR17 pipe, varying in diameter from 8-inches to 12-inches, fused them with the Connectra 314 to create 500-foot lengths that were then flanged to create the 4,500- and 8,000-foot lengths required to reach the beaches at the north and south ends of the creeks, respectively.

At the beach sites large football field-sized basins were dug to serve as dewatering areas where the water-logged sand could drain. The sand was later spread on the beach, replacing sand that had been eroded by the same storms that built up the sediment in the creek beds.

The $430,000 project was completed in April 2008 and the mayor couldn't be happier. The town has successfully protected a precious resource for the wildlife and residents of Pawley's Island, he said, adding, "It's kind of like the birthing process after a long and difficult pregnancy -- we're so excited to see it done." **L&W**

For more information, contact Retention Pond Services, Inc., Hamp Stephens, (910)313-6830; Connectra Fusion, ron.underwood@connectrafusion.com, www.connectrafusion.com, (877)776-7100; Georgia Underground, alan@georgiaunderground.com, www.georgiaunderground.com, (800)245-8339; or Krista Grant Haysom, khaysom@mosaicstudios.com, Mosaic Communications East, (902)830-8339.

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