

Great Gull Bank: Great Sand Source?

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Great Gull Bank lies 4 to 6 miles offshore of the northern part of Assateague Island, Maryland (Fig. 1). It has been recognized as a shoal since at least the early 1900s and is typical of the many detached linear shoals in the region. However, until recently, little was known about the bank in terms of its potential for supplying sand for beach nourishment. Now, thanks to a joint Federal-State research program, new information is available on its sand resources and environmental character.

Great Gull is 3.5 miles long, has a maximum width of 0.8 mile and an area of 2.2 square miles. As with many of the shoals in the area, it is oriented about 40° from north and trends northeast from the shoreline. The bank is an asymmetric feature, with its eastern flank about twice as steep as its western flank. Water depths over Great Gull range from 17 to 50 feet. A "fish haven" or artificial reef was established on the northwestern third of the bank in which various types of debris were placed to create a fish-spawning habitat. This part of the bank has become a popular fishing spot for private and commercial party boats from the Ocean City area.

The State of Maryland began investigating Great Gull Bank and other shoals in the area in 1993 as part of a cooperative program with the Department of the Interior's Minerals Management Service. The bank was grouped with 7 other nearby shoals into "Shoal Field II" for the study. Geophysical surveys were completed in 1994 and based on their interpretation, 7 vibracores were drilled on Great Gull in 1995 under a contract by the U.S. Army Corps of Engineers (USACE). The cores (Fig. 1) ranged in length from 11 to 15 feet and were strategically located to sample both the crest and flanks of the entire shoal. The cores were designated GG-1 on the southern end of the shoal, GG-3, 5, and 6 along the crest, GG-7 on the northern end, GG-2 on the eastern flank, and GG-4 on the western flank. Core GG-1 penetrated moderately sorted, medium sand to a depth of -36 feet and similar sand was found on the shoal's crest to -41 feet. Finer-grained sand occurs in cores GG-2 and 5 to -43 and -46 feet respectively. Core GG-4 has medium to coarse, moderately well-sorted sand to -53 feet on the western flank. Below this depth, sand finer than 2.0 Φ is present. Medium sand changes to fine sand at -34.3 feet in GG-6 on the northern part of the crest. Cores GG-1 and 4 contain the coarsest sand, which appears to be limited to the southwestern part of the shoal at least to -46 feet. Crestal cores GG-3 and 6 contain 9 to 12 feet of medium-grained, beach-quality sand while GG-2, 5, and 7 define an eastern zone of fine-grained, poorly-sorted sand.

Standards for beach nourishment potential of the sand in Great Gull Bank were based on the composite mean grain size (mgs) of native beach sand at Ocean City (1.84 Φ) and sorting index of 1.22 Φ . "High potential" sand has a mgs <1.84 Φ and sorting index <1.22 Φ , and is in <50 feet of water. "Moderate potential" sand has a mgs between 1.84 and 2.0 Φ , a sorting greater than 1.22 Φ or is in water deeper than 50 feet; "low potential" sand is finer than 2.0 Φ . Based on these criteria, sand volumes were estimated for Great Gull using Autodesk's *Civil/Survey* software. These include 15 million cubic yards of "high potential" sand, 19.2 million cubic yards of

“moderate”, and 21.3 million cubic yards of “low”, for a total of 55.5 million cubic yards. Since the cores on Great Gull only went as deep as 15 feet, significantly more sand may occur below this depth.

In Spring 1998, the USACE and National Park Service selected Great Gull Bank as a borrow site for a small emergency nourishment on 1.6 miles of the Assateague Island National Seashore. Environmental studies on Great Gull had been completed by the USACE and MMS began biological and wave modeling studies in the area in 1997. Severe storms during the previous winter had left several parts of the beach vulnerable to breaching. In September 1998, nearly 134,000 cubic yards of sand were dredged from the southern part of Great Gull and placed on the National Seashore. This marked the first time sand from Federal waters (seaward of 3 miles from shore) was used in Maryland. The State of Maryland plans to place another 100,000 cubic yards of sand from Great Gull Bank on the 2-mile stretch of State-owned beach on northern Assateague Island in late Summer or Fall of 1999. Based on survey and sampling information and initial results of the of National Seashore nourishment project, Great Gull Bank appears to be an excellent source for beach sand for the future.

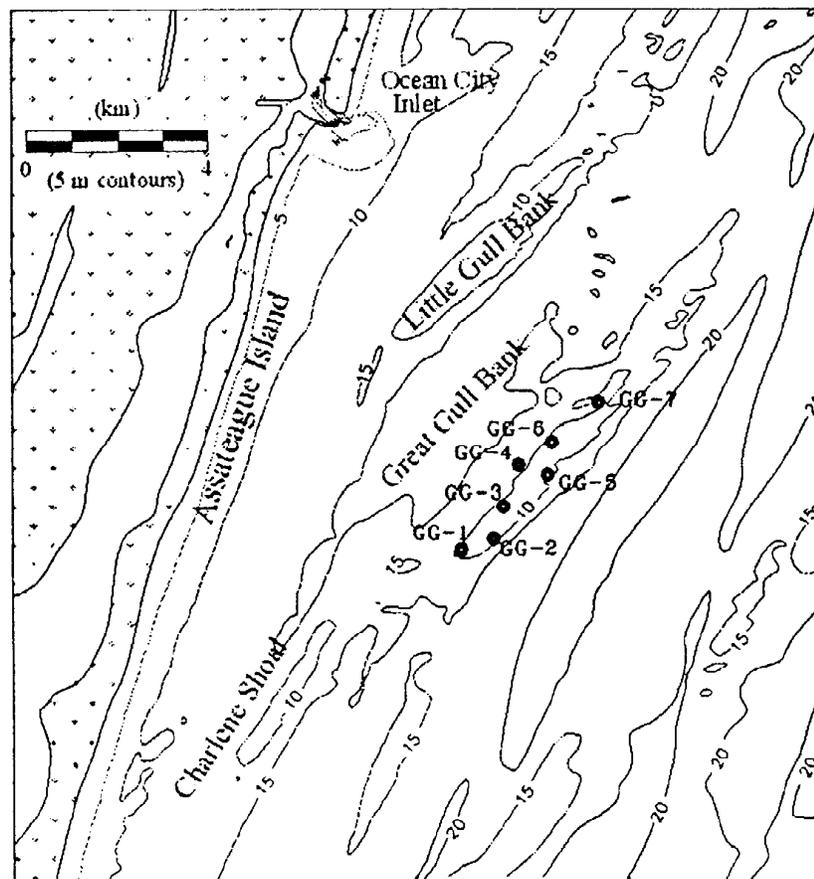


Fig. 1. Map of a portion of the Maryland continental shelf showing Great Gull Bank and associated vibracore locations.