

**SHORELINES – October 2002**  
**As presented to the Island Review Magazine.**

**WHAT IS SAND?**

It is a source of recreation, we enjoy the feel of it between our toes, it protects our homes and infrastructure, and it sustains a host of birds, mollusks, plants, and other wildlife. Of course we are referring to one of our greatest natural resources – sand. But what really is sand? Is it shell or quartz, is it round or angular, or is it large or small? Actually, the word sand is a strict term that is limited to size only. And very precise size at that. “Sand” is a particle that measures between 1/16 to 2 mm in diameter. Note that there are no references to composition (shell material, quartz, basalt, etc.), shape (angular, sub-rounded, etc.), or to the degree that all of the grains in a sample are similar in size (a term referred to as sorting). You may have heard of the black sand beaches of Hawaii. What does this really mean? Easy, some beaches in Hawaii are covered with particles of black volcanic rock that measure between 1/16 to 2 mm in diameter. You may have also heard of the white sandy beaches of the Bahamas. In this case, the “white” is in the form of sun-bleached grains coated with carbonate. The size? You guessed it, between 1/16 and 2 mm in diameter.

You may now be wondering what we call particles that are smaller or larger than sand? A particle larger than 2 mm is referred to as gravel. Within the gravel range, there are other size thresholds that determine if the gravel is a boulder, cobble, pebble, or granule. If a particle is smaller than sand, i.e., smaller than 1/16 mm in diameter, the particle can be considered a silt or clay. Silt is a particle that measures between 1/256 to 1/16 mm, and clay is a particle that measures below 1/256 mm in diameter. Often silt and clay are classified together using one of my more favorite scientific terms - mud. Think about what the term “mud” really means – it is a sedimentary particle that measures less than 1/16 mm in diameter.

Let's test our newfound sedimentary knowledge. What should we call a handful of material that is comprised entirely of broken shell fragments that are approximately 1 mm in diameter? How about a handful of smoothly rounded quartz grains that are all approximately 1.75 mm? Or a handful of quartz grains, broken shells, and black grains of heavy minerals and phosphate that are all approximately 0.5 mm? The answers are sand, sand, and sand!!! Of course, there are many descriptive adjectives we can use to help describe our handful of sand. For instance, an angular, poorly sorted, shelly sand connotes that we are looking at mostly sharp fragments of shells with no predominant sand grain size. On the other hand, a well-rounded, very well sorted, shelly sand should conjure an image of smooth, rounded grains of shells that are all approximately the same size.

You may be asking yourself how do we actually determine the precise sizes contained in a handful of sand. We really have two options. The first is to take a hand lens and try to guesstimate sizes. This approach is a useful method in the field. However, a more precise approach, and the favorite of scientists and engineers, is to dry the samples and then pour the samples through a stack of sieves. These sieves have specific-sized openings with the sieve containing the larger-sized opening at the top with sieves of progressively smaller-sized openings stacked underneath. The gravel, sand, or mud will remain in the sieve whose openings are smaller than the actual grains. The stack of sieves are shaken and tapped mechanically, and the material remaining in each sieve is weighed to determine the exact size characteristics of the sample. We can even break down “sand” into specific terms that describe its size even further such as very fine sand (1/16 to 1/8 mm), medium sand (1/4 to 1/2 mm), and very coarse sand (1 to 2 mm). The next time you're walking the beaches of Bogue Banks, Shackelford Banks, or Cape Lookout, pick up a handful and enjoy your sand.

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**Beach Commission Update**

The Beach Commission approved a modified version of the "Sand Management Plan" Water Resources Development Act (WRDA) 2002 language in their August regular meeting. This latest version of the language will be re-submitted to the N.C. Congressional delegation. The language will hopefully be included in the House and Senate final reports and ultimately incorporated into the final WRDA of 2002. The Commission also welcomed Chris Freeman from the University of North Carolina's Institute of Marine Sciences. Mr. Freeman presented a summary of the Bogue Banks Beach Monitoring Program efforts to date and outlined the monitoring schedule for the remainder of the year. For a more detailed review of the proceedings of Beach Commission meetings, please visit <http://co.carteret.nc.us/shoreprotection/minutes/minutes.htm>.