# A day at the beach helps model how sound moves through coastal areas

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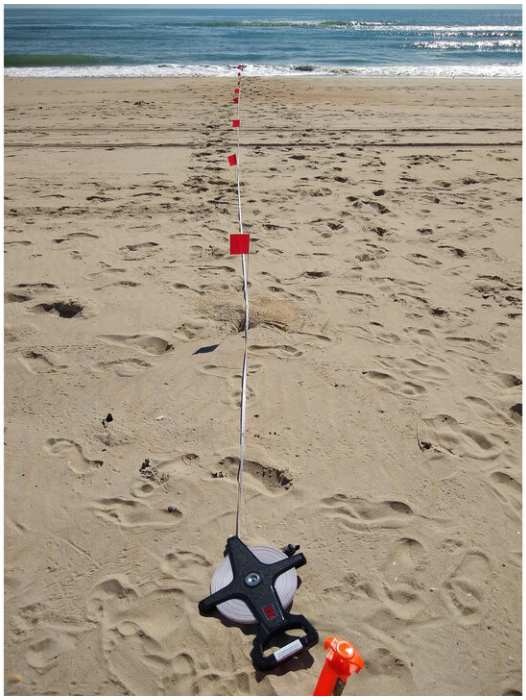

At a North Carolina beach, researchers have been poking and prodding the sand to study how moisture levels affect sounds as they move across the environment. Over short distances, even moderately wet sand reflects sound more like water does than as a solid surface does. Faith Cobb and her team are looking into if the same is true for long-range sound propagation. Credit: Faith Cobb

On a beach in North Carolina, researchers have been poking and prodding the sand to study how moisture levels affect sounds as they

move across the environment.

Over short distances, even moderately wet sand reflects sound more like water does than as a solid surface does. Faith Cobb, from East Carolina University, and her team are looking into if the same is true for long-range sound propagation to develop numerical models that describe how sound travels across large coastal areas.

Their findings will be presented in "Characterization of sand moisture profiles for improved atmospheric acoustic modeling" as a part of the 179th Meeting of the Acoustical Society of America. This session will be presented Dec. 10. The meeting will be held virtually Dec. 7-10.

To understand how sounds originating offshore make it on land, factors that affect how the sound travels over long distances need to be accounted for. This includes myriad things, such as wind speed, wind direction, sea state, beach topography, temperate, and humidity, to name a few.

The researchers decided to focus on one aspect of how sounds travel across beaches: moisture in the sand. Scientists know moisture affects how much sound is absorbed by sand, and previous work had been conducted on artificial lake sand, but no one had tested the theory in coastal areas.

The scientists sampled sands at a relatively flat and uniform beach at several depths and tested them for their moisture content. This involved using moisture probes stuck into the sand, collecting samples to test the sand's gravimetric water content and using an impedance tube to test the sand's conductance.

While beach moisture is just one factor of many, the work will help researchers model the overall environment to understand how sound

moves through the air in coastal areas.

**More information:** acousticalsociety.org/technical-program/

Provided by Acoustical Society of America