2. Title and Subtitle.
Time-varying, high-frequency bottom backscattering

6. Author(s).
S. Stanic, E. Kennedy, and R. Ray

7. Performing Organization Name(s) and Address(es).
Naval Oceanographic and Atmospheric Research Laboratory
Ocean Science and Ocean Acoustics and Technology Directorate
Stennis Space Center, MS 39529-5004

11. Supplementary Notes.

Continuous wave (cw) signals at frequencies between 20 and 180 kHz were backscattered from a shallow-water ocean bottom. Even though the source and receiver were mounted on a stable platform, the short-range (50-300 ft) bottom backscattering envelopes exhibited significant amplitude variations that increased as the grazing angles became smaller. Evidence suggests that the oceanic fine structure caused frequency-dependent shifts in the location of the sonified bottom area. These small shifts resulted in changes in the bottom scattered ping-to-ping envelope structure.

14. Subject Terms.
(U) High Frequency; (U) Acoustic Scattering; (U) Backscattering;
(U) Forward Scattering; (U) Sound Transmission; (U) Underwater

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