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The effects of small-scale fluctuations in the oceanic thermodynamic field on bottom reverberation are simulated for monostatic source/receiver geometries. Fluctuations in the near-source environment may lead to large changes in the vertical arrival structure at the water-sediment interface. The changes in vertical arrival structure lead to changes in observed reverberation time series. Using models based on observations of oceanic fine temperature structure, a series of upper ocean sound-speed profiles is derived, the resulting sound-speed fields are then used to derive the reverberation statistics.

Delete abstract on Report Documentation page-use abstract on next page per telecon Nancy Pentimonti. Naval Oceanographic and Atmospheric Research Laboratory/Code 125L Stennis Space Center, MS 39529-5004.
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9UW6. Classification of underwater acoustic transients by artificial neural networks. Ronald L. Greene (Dept. of Physics, Univ. of New Orleans, New Orleans, LA 70148) and Robert L. Field (NOARL, Stennis Space Ctr., MS 39529)

Artificial neural networks have been trained using the backpropagation algorithm to classify a variety of model transient source signals. The networks were then tested on signals propagated to 25 different receiver sites by the time-domain parabolic equation model. Despite the interference effects from surface and bottom reflections, the classification accuracy is about 90% in the noise-free case, virtually identical to that of a nearest-neighbor classifier on the same problem. Classification in the presence of noise is considerably reduced; however, the redundancy provided by the multiple receivers in most cases allows the network to correctly classify all signals from sources on which it was trained. In addition, it shows a robustness in the presence of unknown signals not shown by the nearest-neighbor classifier. [Work supported by the Naval Oceanographic and Atmospheric Research Laboratory through the U. S. Navy/ASEE Summer Faculty Research Program.]

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