

# Geoacoustic Inversions in Shallow Water Using Direct Methods and Genetic Algorithm Techniques

Kevin B. Smith\*, José G. Rojas\*, James H. Miller\*\*, Gopu Potty\*\*

## Abstract

During the summer of 1996, the first of two ONR-sponsored shelf break acoustic experiments was conducted near the Mid-Atlantic Bight off the coast of New Jersey. Vertical line arrays of receivers placed near the edge of the shelf were used to record the acoustic transmissions of several sources including air-deployed SUS explosive charges. In between such scheduled transmissions, the ambient noise field was also recorded. From the vertical coherence of the ambient noise field and wavelet scalograms of the SUS transmissions, attempts are made to estimate the bottom sound speed, density, and attenuation. The results from these calculations are then compared to those values obtained from a genetic algorithm technique in which a numerical propagation model is employed to produce replicas of the predicted transmission. The results indicate a bottom sound speed near the surface of the interface of roughly 1565 m/s. However, the SUS data were found to produce inconclusive density and attenuation results.