

MASTER OF SCIENCE IN ENGINEERING ACOUSTICS

THE INFLUENCE OF SHALLOW WATER VARIABILITY ON SHORT RANGE WATER BOURNE PROPAGATION

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Interest in enhancing the forecasting capabilities of both active and passive sonar systems employed in littoral regions has greatly escalated over the past 10 years. This requires a need for improvements in the general understanding of the influence of shallow water variability on acoustic propagation. This work examines the influence on the relatively short-range water-bourne propagation paths of shallow water variability. Both internal wave fluctuations and random sound speed perturbations will be considered. The effects of littoral variability on acoustic propagation will be quantified in terms of spatial (vertical) coherence functions. Since the effects of the water-column variability is of interest, the direct water-bourne propagation path will be solely analyzed. The data to be examined will be generated numerically based on an acoustic propagation model employing environmental data taken from the East China Sea as part of the ONR-sponsored ASIAEX experiments.

KEYWORDS: Shallow Water Variability, Range Independent, Range Dependence, Internal Wave Perturbations, Random Perturbations, Vertical Coherence