



# Estimate of Uncertainty in Acoustic Propagation adjacent to the Strait of Korea

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***UNITES***



# Outline of Talk

Overview of Area

The environment

Oceanography

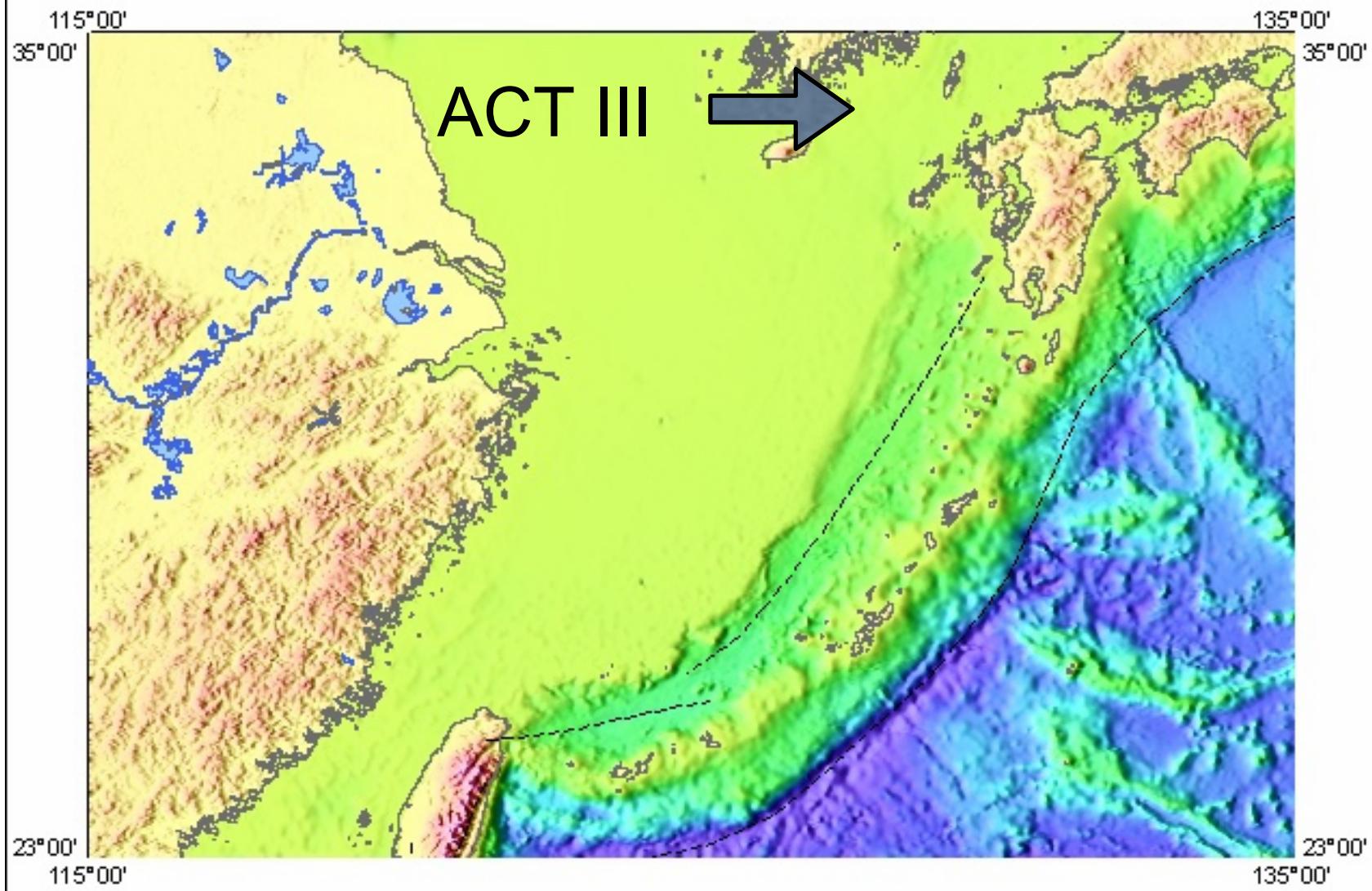
Geophysics

Results

Conclusions

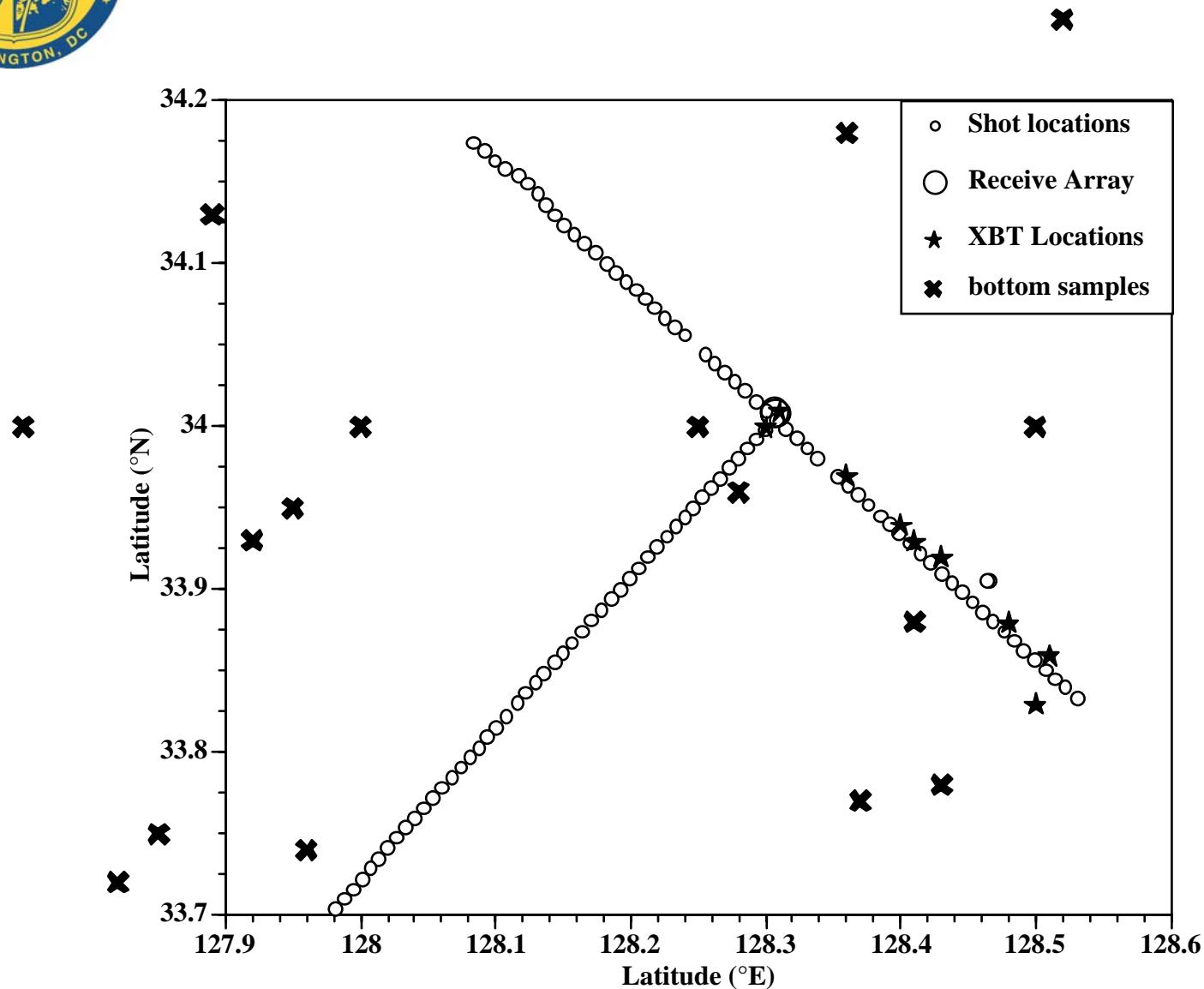


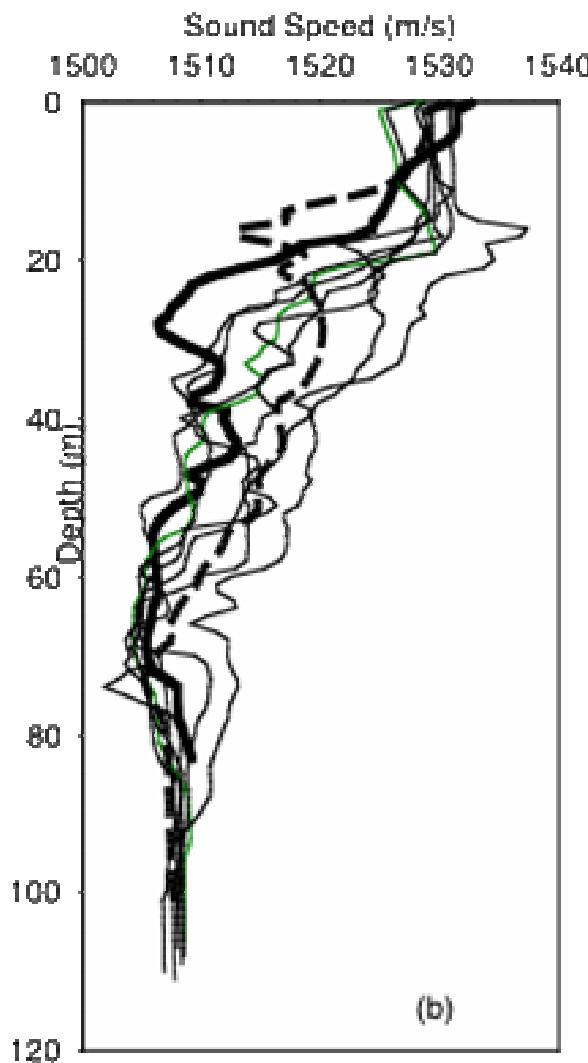
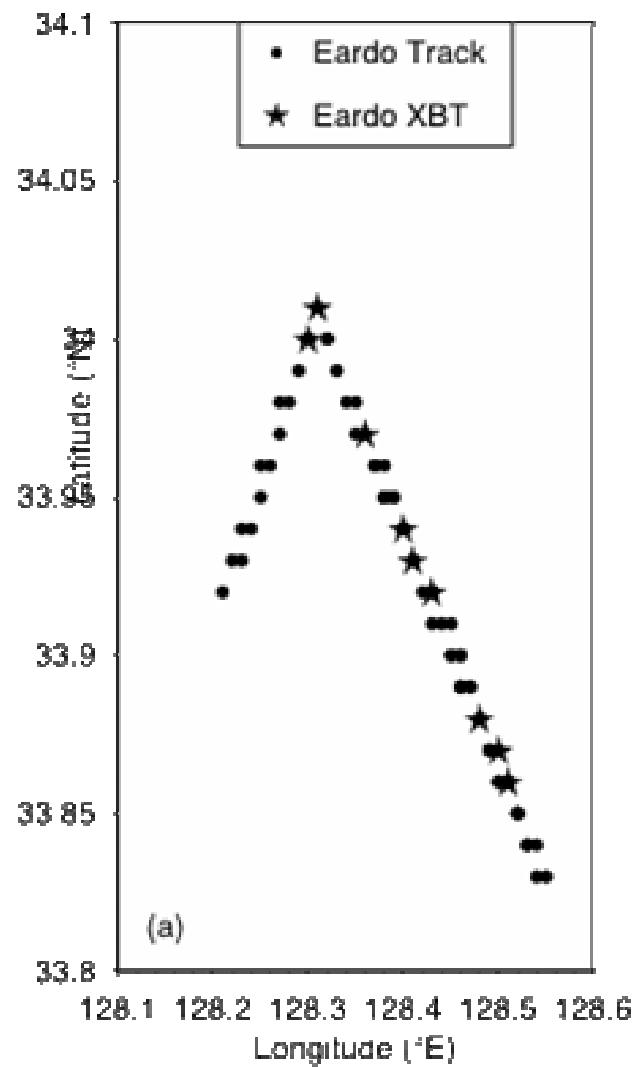
## East China Sea (ECS)

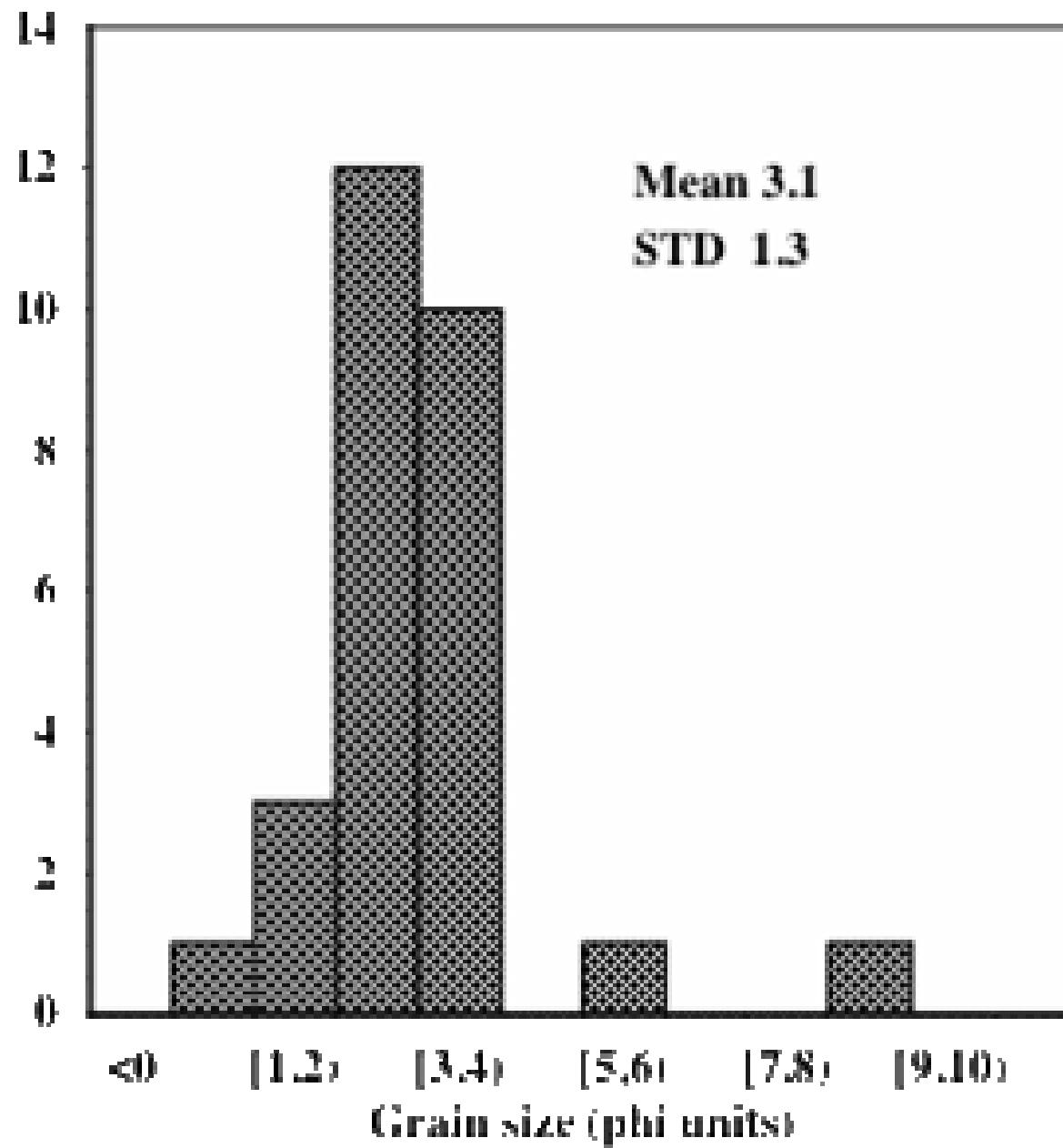




# A-TL 1 locations

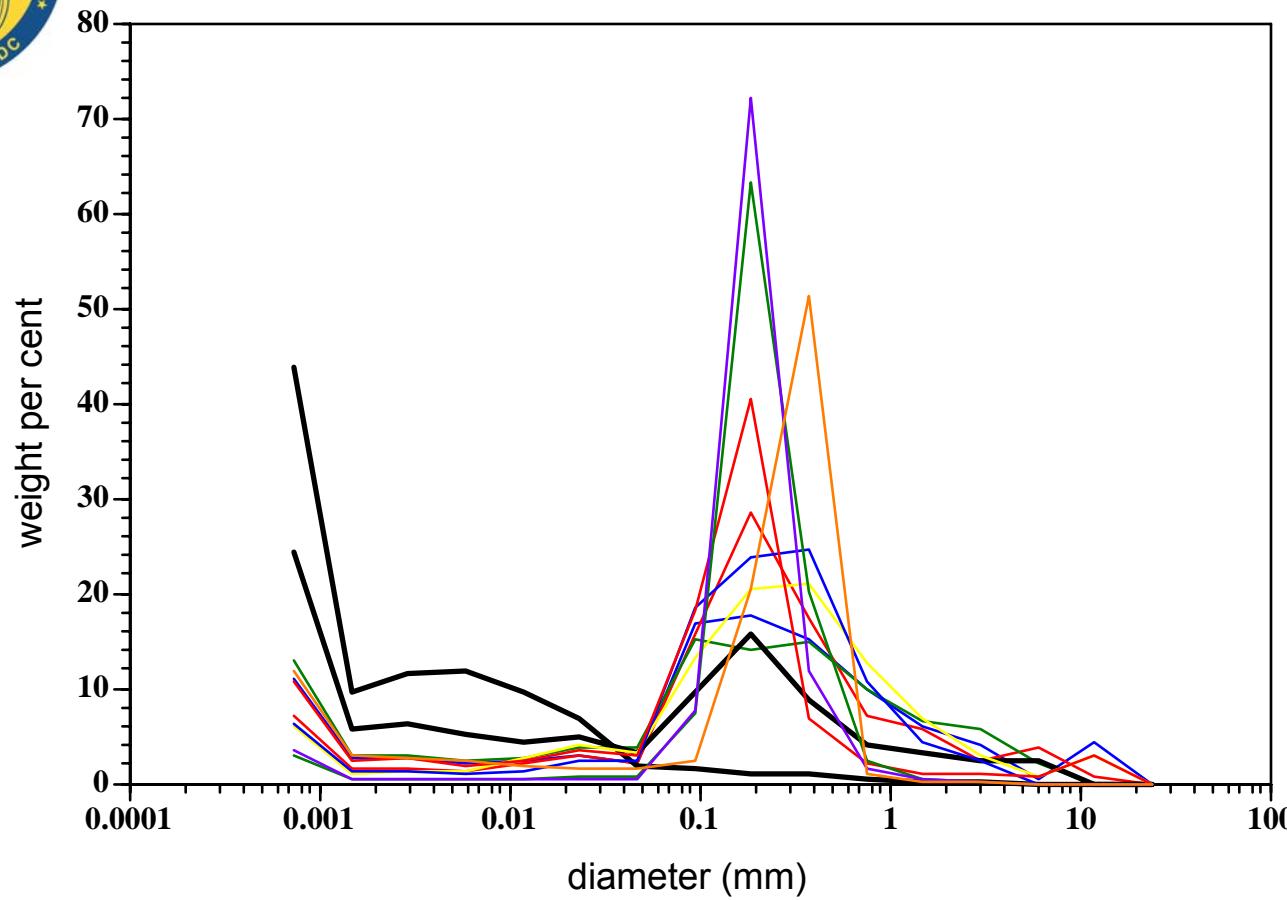








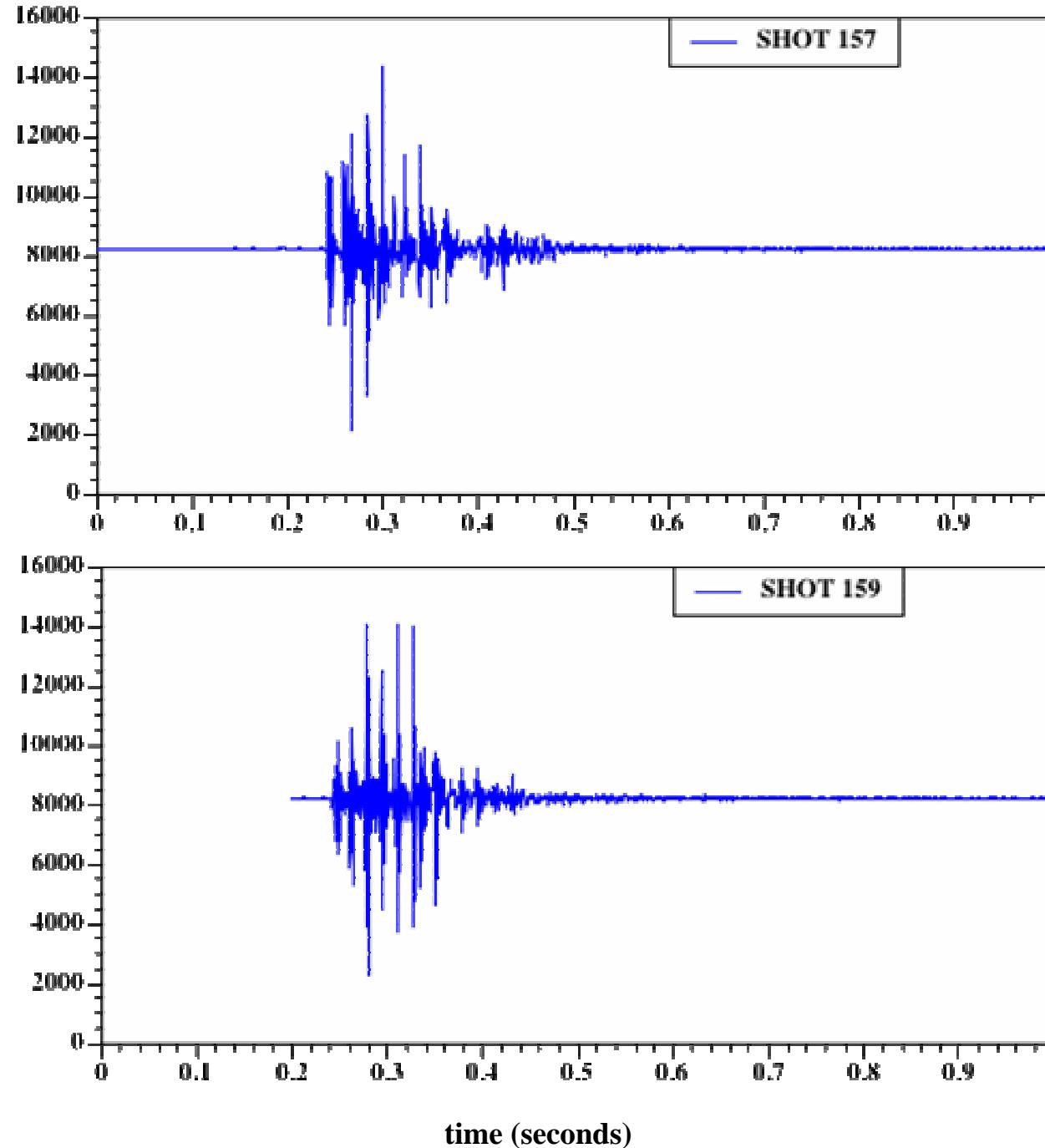
## Site 1 In situ G&G



Surficial Velocity Ratio:  $1.07 \pm .01$



# Shot signature variability





# Inversion Process

Use GA algorithm

compute 951 PE runs (50-1000 Hz)

synthesize time series at receiver

measure is absolute value of integral  
of the absolute error

not particularly efficient ~ 2 wks per inversion



## one layer geoacoustic model

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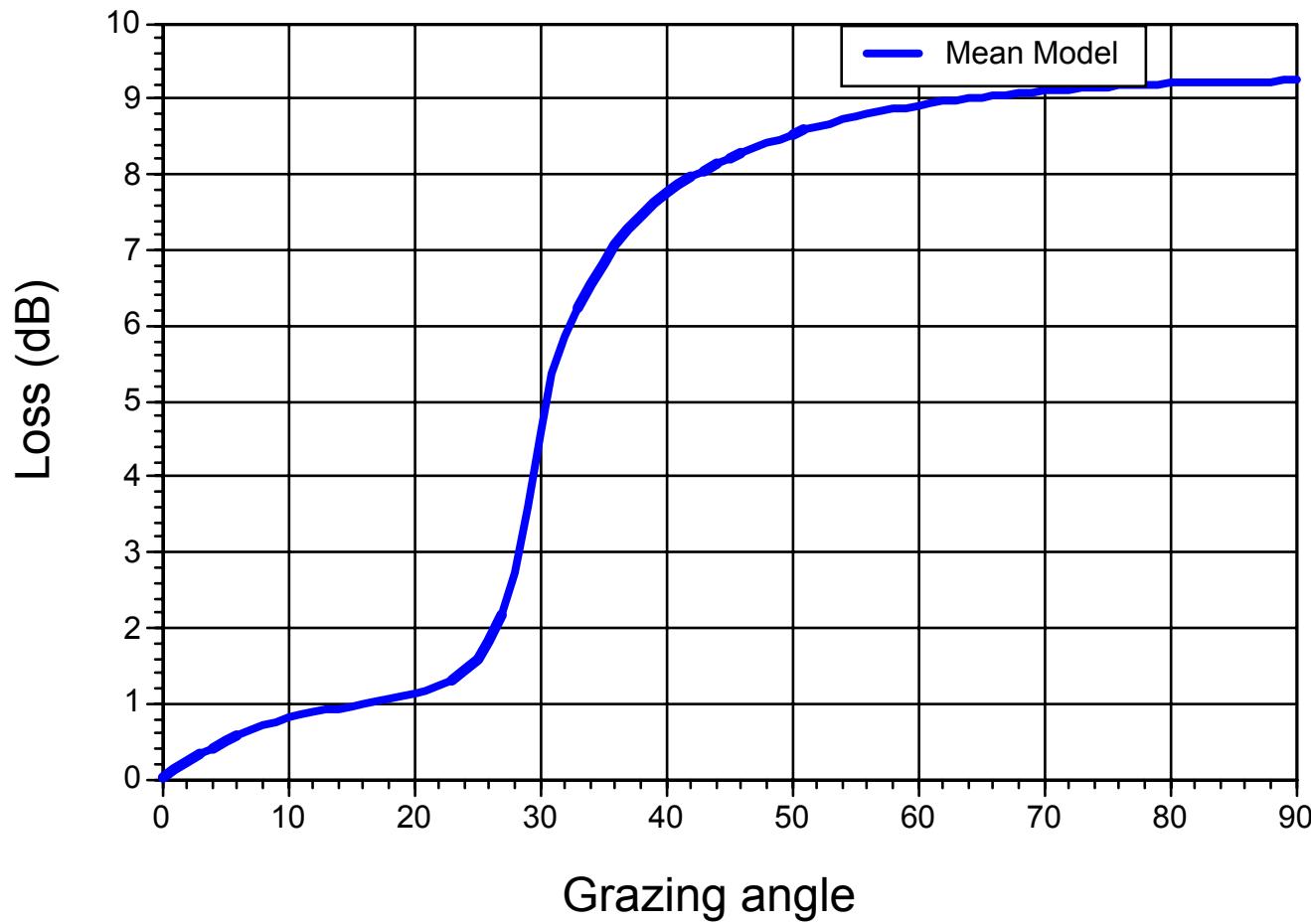
$3 \pm 1 \text{ m}$	$1630 \pm 20 \text{ m/s}$	$\alpha = .6 \pm .3$
	$\rho = 1.9 \pm .1$	
	$1740 \pm 40 \text{ m/s}$	$\alpha = .3 \pm .1$

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$1850 \pm 50 \text{ m/s}$   $\rho = 2.1 \pm .1$



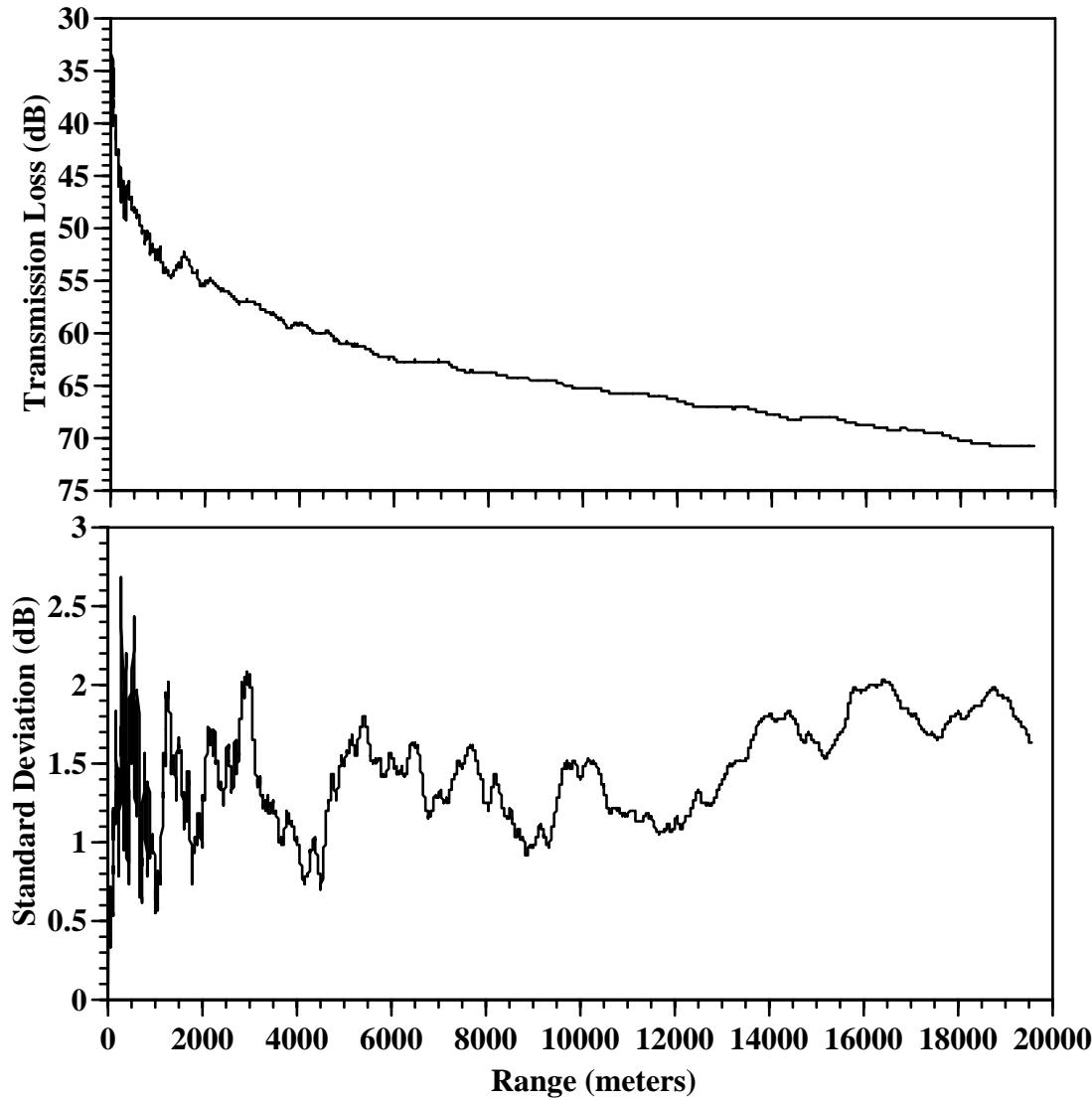
# Bottom Loss averaged (complex reflection coefficient) over range 50 to 100 Hz





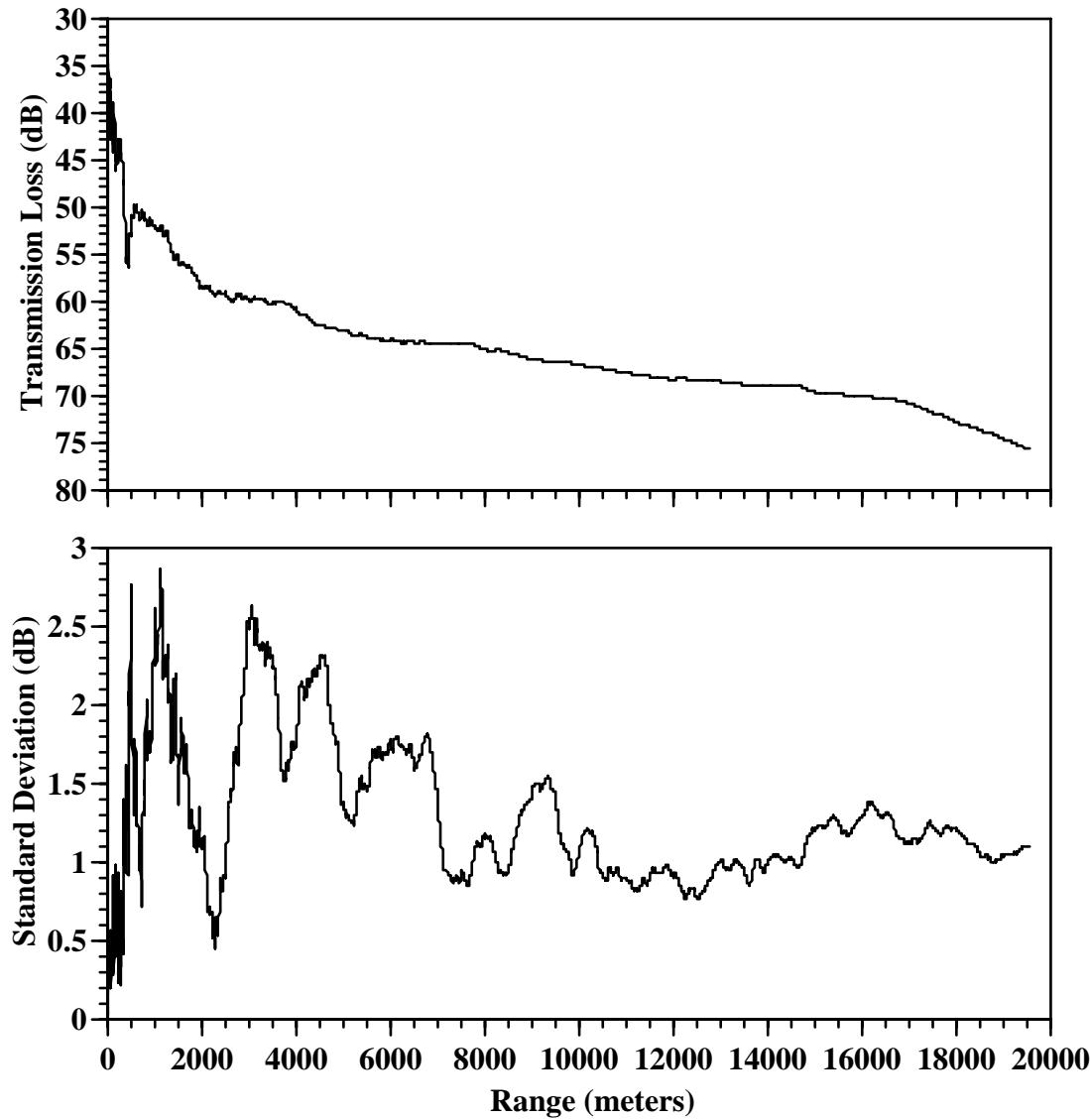
# all sound speed/geoacoustic

## s/r 40m



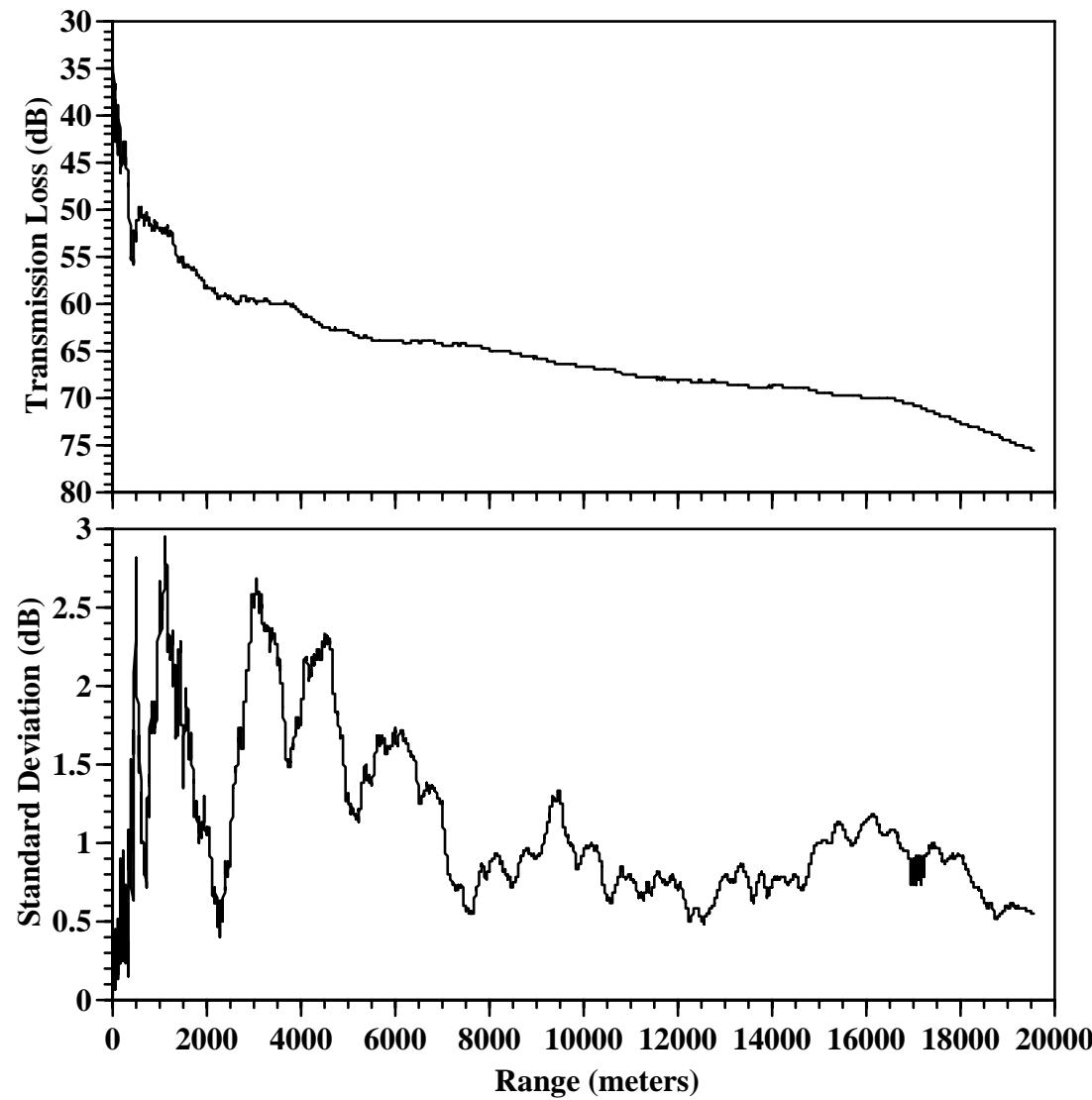


# all sound speed/geoacoustic s 40m/ r bottom



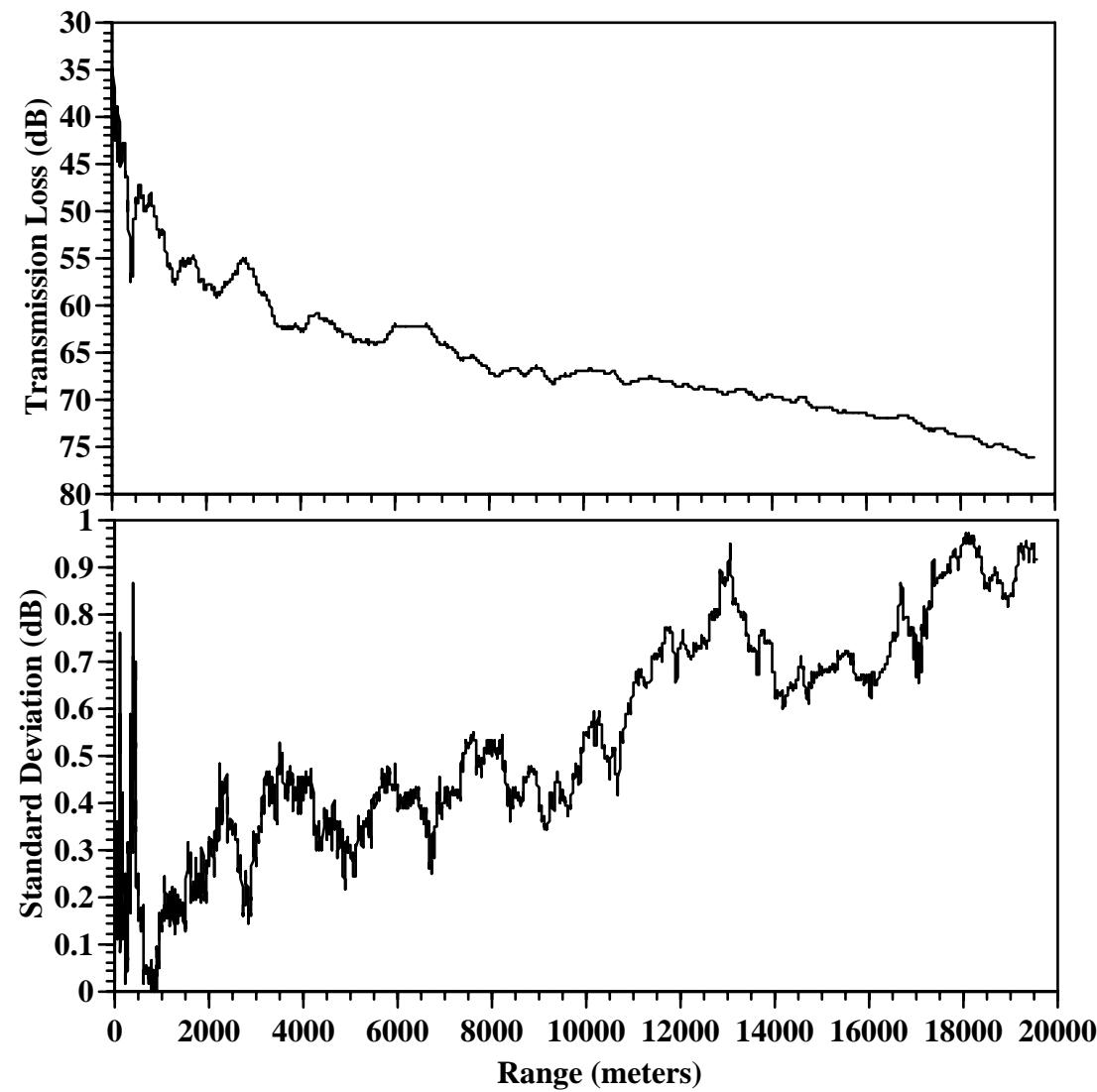


# all sound speed/ single geoacoustic s 40m/ r bottom



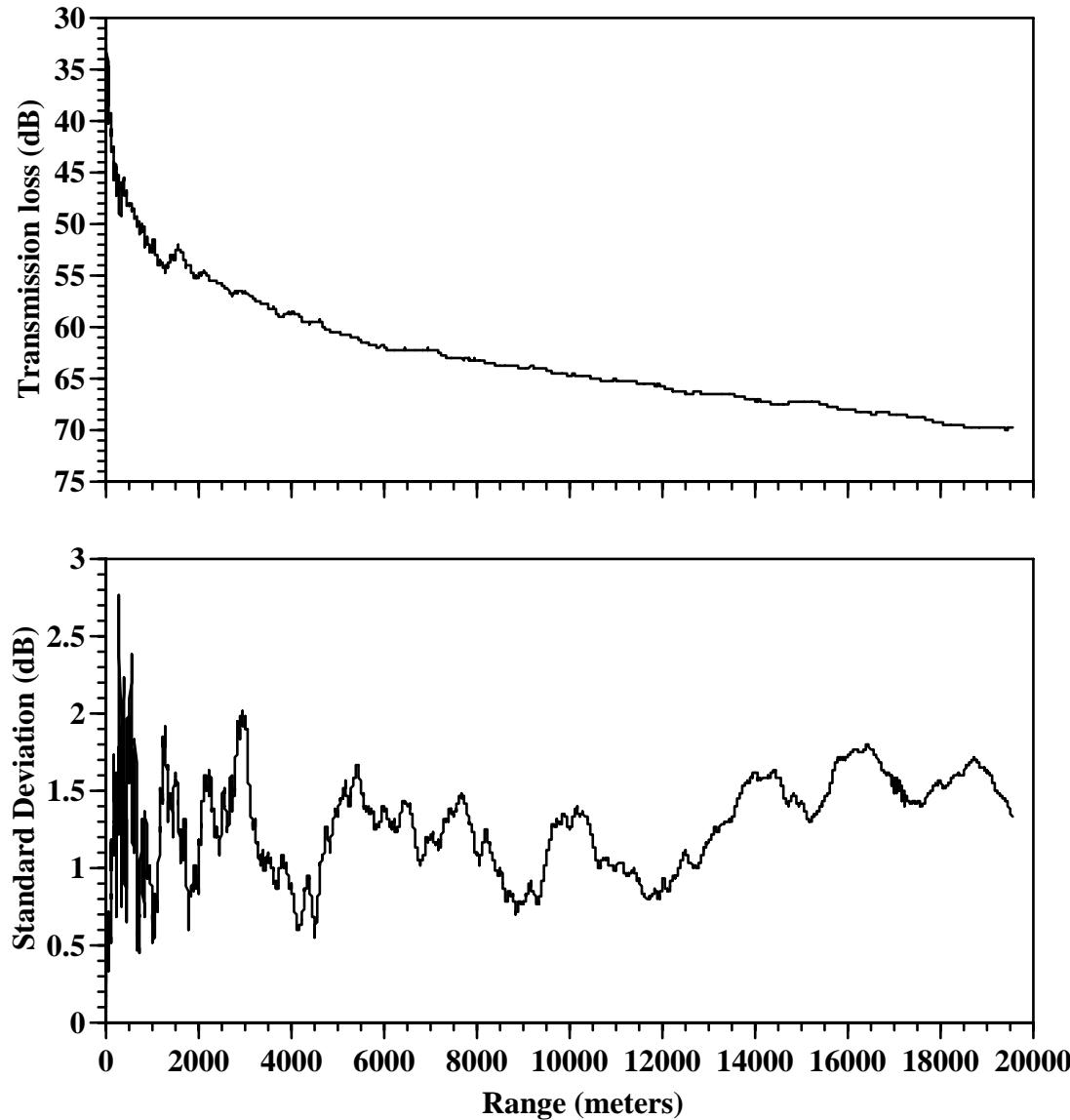


# single speed/ all geoacoustic s 40m/ r bottom



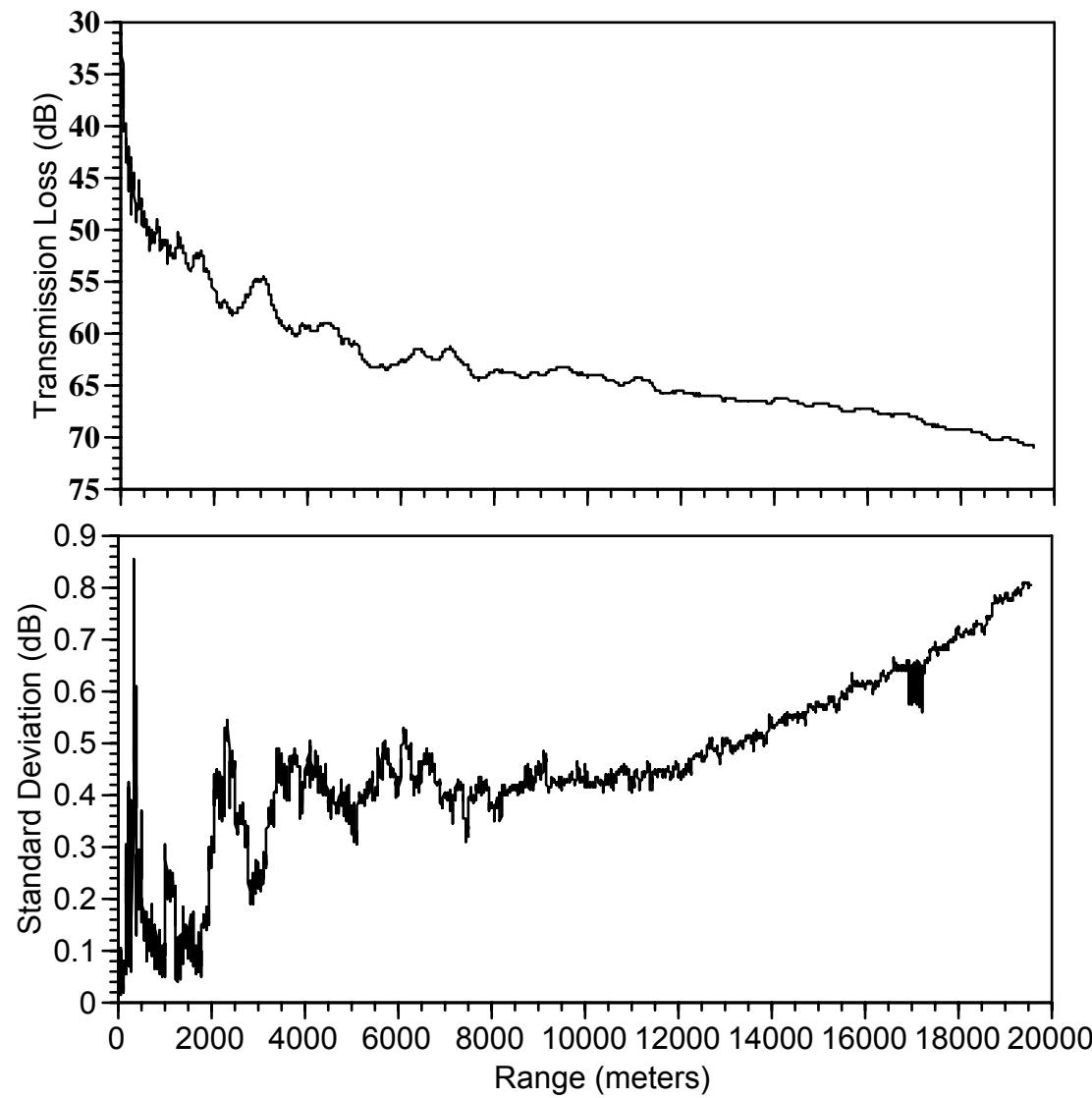


# all sound speed/ single geoacoustic s/r 40m





# single / all geoacoustic s 40m/ r bottom





## Summary

geoacoustic environment show little variation  
mesoscale variation in sound speed  
uncertainty in acoustic prediction driven by  
sound speed