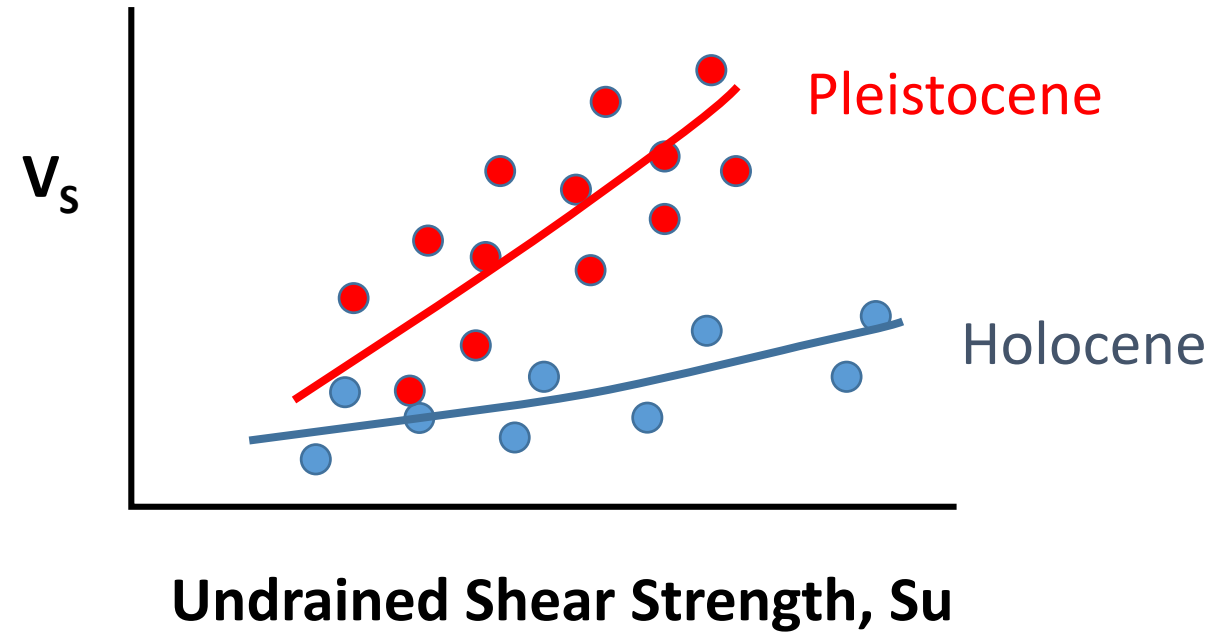


Vs Estimation and Site Class Assignments

Proposal No. 25

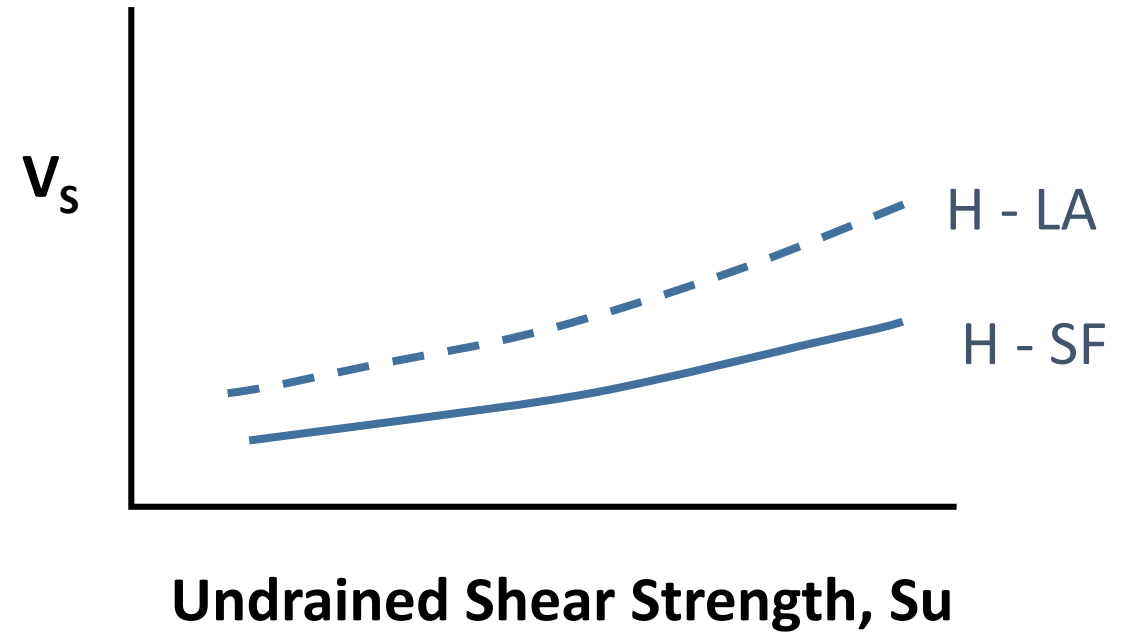
IT7-1

Shear wave velocity (V_s) is related to other geotechnical parameters



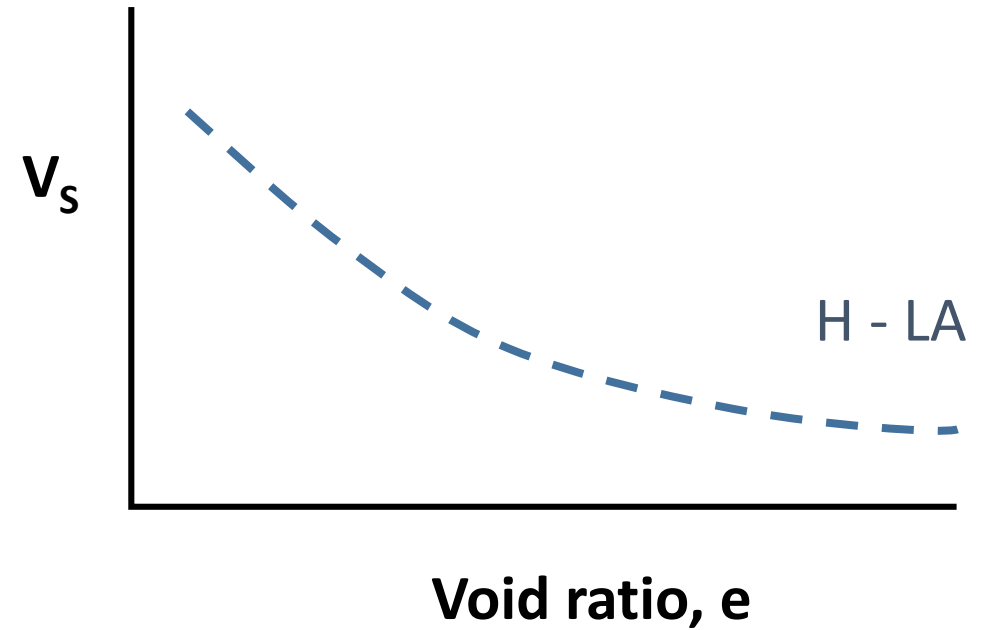
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These models tend to be regional



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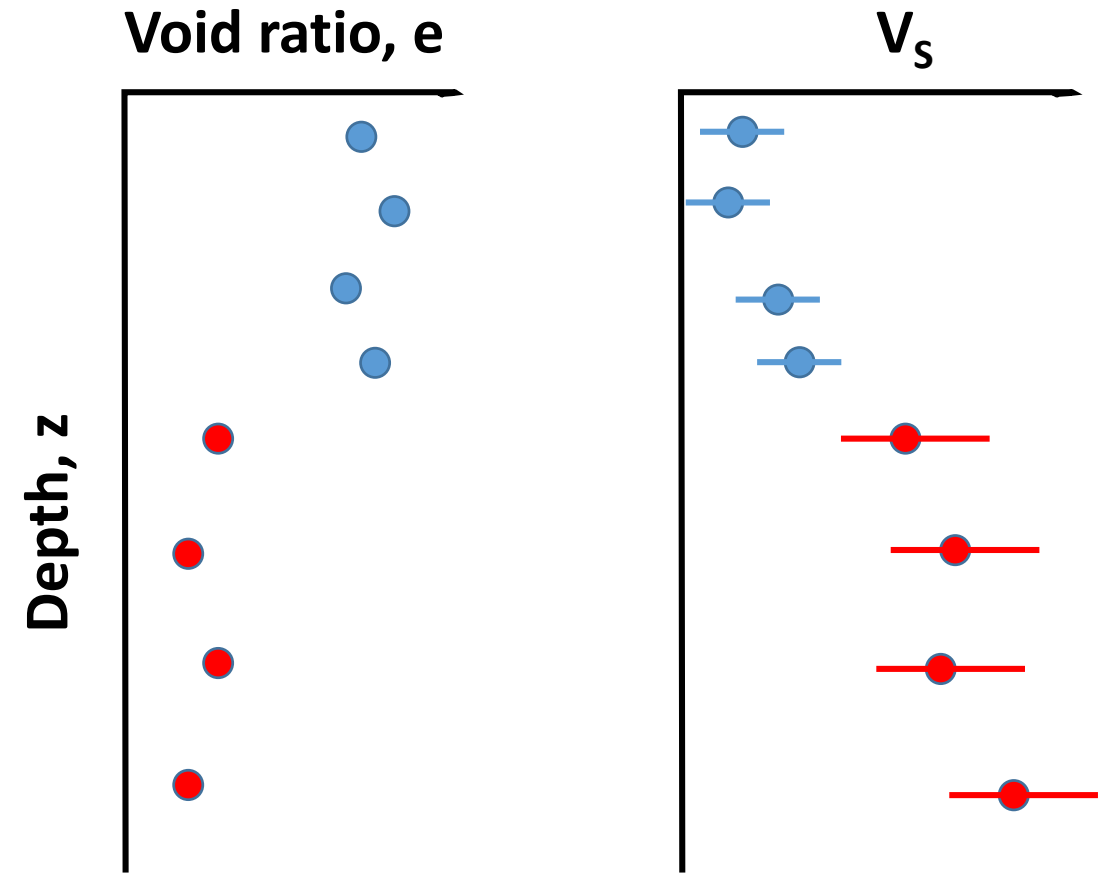
These models tend to be regional, and may use different variables appropriate for different soil types



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These models can be used to estimate V_s profiles with uncertainties

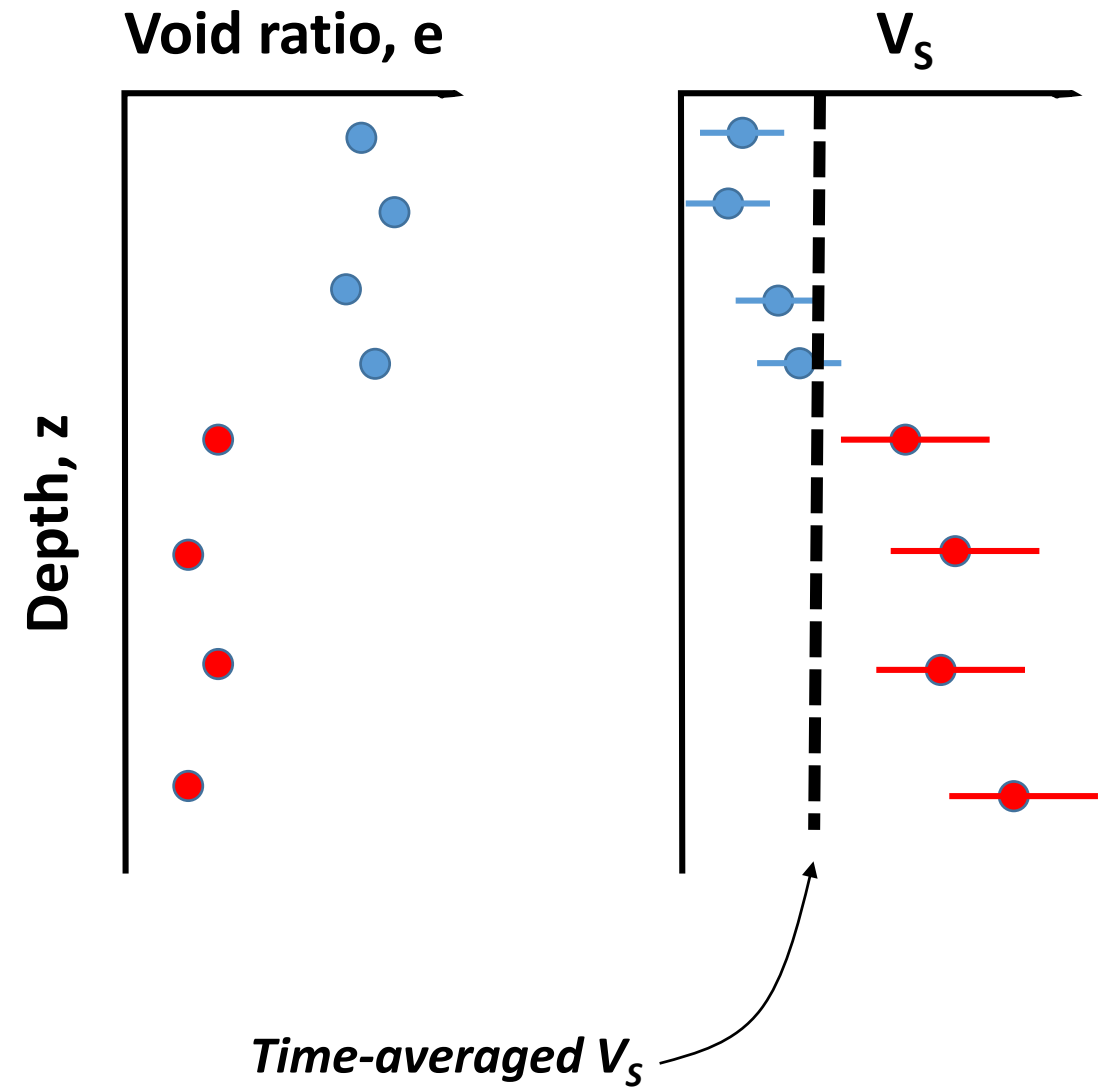


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from which V_{s30} (and site class) can be determined



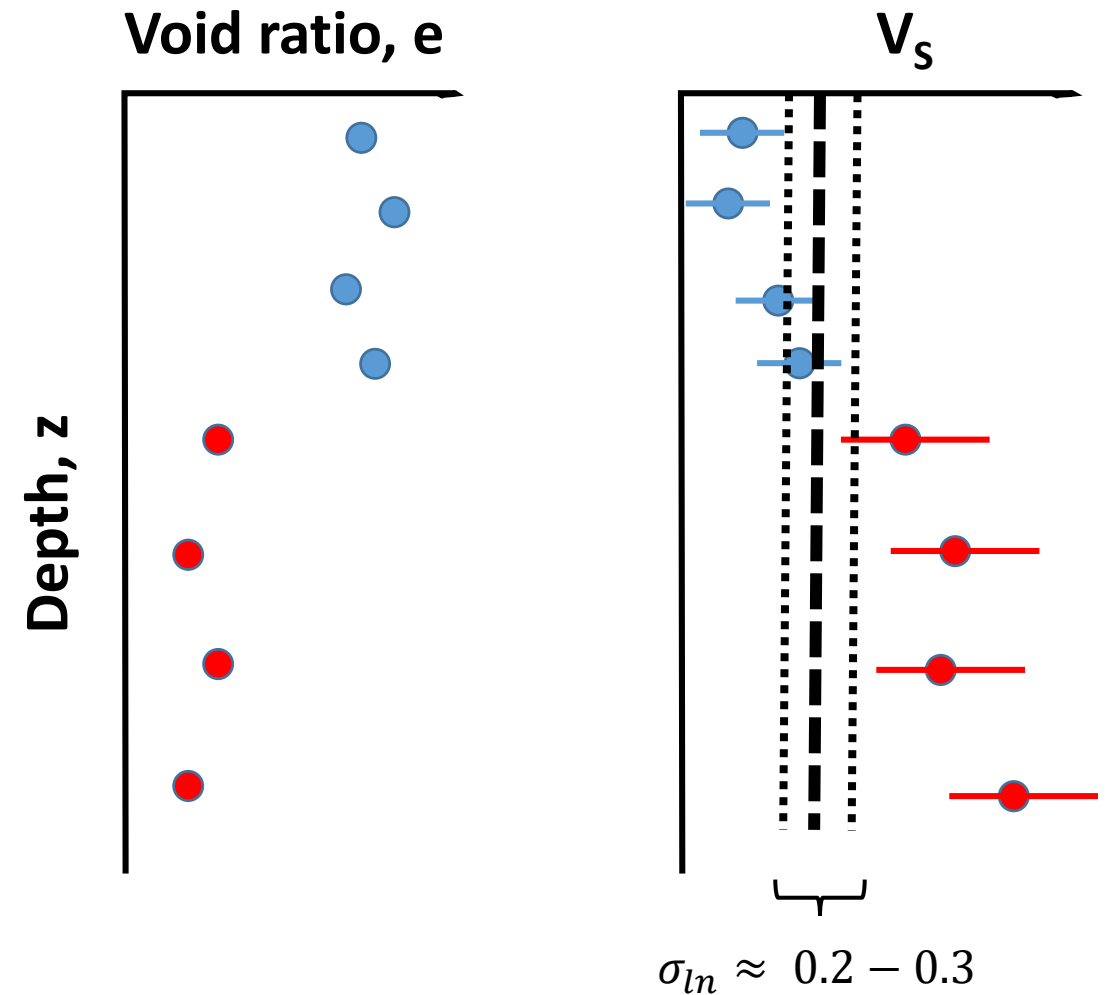
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These models tend to be regional, and may use different variables appropriate for different soil types

These models can be used to estimate V_s profiles with uncertainties

from which V_{s30} (and site class) can be determined

Uncertainty in $V_{s30} <$ uncertainty in an individual value of V_s



What's wrong with what we do now?

- We allow site classification based on V_{s30} , N_{30} , or Su_{30}

Table 20.3-1 Site Classification

Site Class	\bar{v}_s	\bar{N} or \bar{N}_{ch}	\bar{s}_u
A. Hard rock	> 5,000 ft/s	NA	NA
B. Rock	2,500 to 5,000 ft/s	NA	NA
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	> 50 blows/ft	> 2,000 lb/ft ²
D. Stiff soil	600 to 1,200 ft/s	15 to 50 blows/ft	1,000 to 2,000 lb/ft ²
E. Soft clay soil	< 600 ft/s	15 blows/ft	1,000 lb/ft ²
	Any profile with more than 10 ft of soil that has the following characteristics: Plasticity index $PI > 20$, Moisture content $w \geq 40\%$, Undrained shear strength $\bar{s}_u < 500$ lb/ft ²		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

Note: For SI: 1 ft = 0.3048 m; 1 ft/s = 0.3048 m/s; 1 lb/ft² = 0.0479 kN/m².

What's wrong with what we do now?

- We allow site classification based on V_{s30} , N_{30} , or Su_{30}
- N_{30} and Su_{30} (time-averaged blow / Su) have no physical meaning
- The equivalence between N and Su and the average shear wave velocity implied in the current Table 20.3.1 is questionable.
- Current correlations, even when applied to appropriate soil types, are out of date, and do not consider regional variations
- The GE need not develop a V_s profile
- There is no need to recognize uncertainty in V_{s30} (and site class), thus no incentive to perform a proper investigation

Proposal

- Link site classes to only V_{s30} in *Provisions*
- Allow for underlying V_s profile to be measured directly or developed from suitable correlations
- A penalty could be imposed when uncertainty in V_{s30} allows more than one site class to potentially be assigned
- In *Commentary*, provide relevant parameters for V_s correlations in different soils. Provide example relationships.