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Please fill in your abstract title.	Enhance - Estimate - Image: A New Processing Approach for Seismic Data with a Low Prestack Signal-to-Noise Ratio	
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Abstract

Objectives/Scope:

Seismic data from small field arrays or single sensors in a desert environment is often recorded with a lower signal-to-noise ratio than required for conventional processing. The objective of this work is a new approach that can effectively address this problem called Enhance - Estimate - Image.

Methods, Procedures, Process:

The Enhance phase obtains a dramatically better estimate of the prestack signal by stacking an ensemble of neighboring traces. The Estimate phase extracts improved prestack processing parameters from the enhanced data (including velocity, deconvolution operators, surface-consistent scalars, statics). The Image phase is where we apply the improved parameters either to the original or enhanced data or data enhanced differently for imaging. The amount of enhancement may vary for each task based on wave propagation physics, signal quality and the purpose of the output. To estimate processing parameters, strong enhancement may be best, while to preserve true amplitudes, milder enhancement may be preferable.

Results, Observations, Conclusions:

We show that the proposed Enhance - Estimate - Image approach is critical for modern high-channel count data both for imaging as well as for data conditioning for estimation of prestack attributes and inversion. While theoretically it may not be desirable to mix signals from different traces, in practice if the signal has very low signal-to-noise ratio - mixing for the Enhance stage may be a very fruitful step that allows to bring this signal back. Our real data examples show that by using the proposed approach we can obtain sharper imaging results and manage to improve vertical resolution across the entire section both shallow and deep. Different enhancement methods may be used during the early stages making the proposed approach very versatile and flexible.

Novel/Additive Information:

We propose a new approach to processing single-sensor and challenging data, dubbed Enhance - Estimate - Image. We present an initial implementation where smart supergrouping is utilized for the Enhance stage. A field example validates this approach, and shows obvious improvements compared to conventional single-sensor processing.