

## S41A-12

### Free gas and gas hydrate saturation from multi-component seismic reflection data from Hydrate Ridge

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A seismic experiment comprising streamer, OBS and VSP surveys was carried out in summer 2002 at the Hydrate Ridge to map gas hydrate distribution within the hydrate stability zone. We have carried out an interactive velocity analysis of P- and converted S-waves in the tau-p domain. Our approach to multicomponent data analysis comprises three steps: 1) P-wave analysis, 2) PP to PS event correlation, and 3) S-wave analysis. PP to PS correlation is performed using synthetic seismograms. Once the P- and S-wave velocities are estimated, they are matched with modeled velocities based on an appropriate rock-physics model to estimate the gas hydrate saturation. Here we modeled the P- and S-wave velocities using an equation based on a modification of Wood equation that makes use of a rock physics model and an empirical relation. Our analysis of the multi-component ocean bottom seismometer data recorded at Hydrate Ridge, offshore Oregon reveals that the P-wave velocity is more sensitive to the saturation of gas hydrates and free gas than the S-wave velocity. The gas hydrate saturation is estimated to be up to 7 percent of the rock volume. The S-wave velocity does not show an anomalous increase in the hydrate-bearing sediments. It is more likely that the hydrates form within the pore space within our survey area of southern Hydrate Ridge.