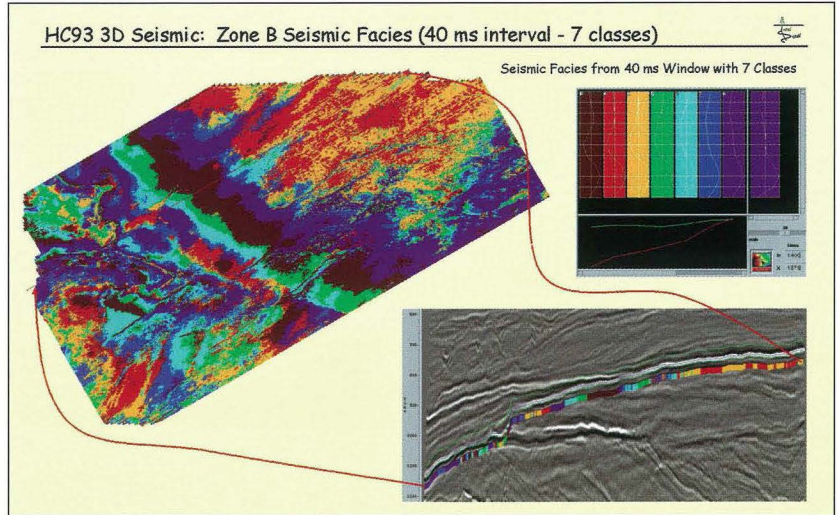


Using Unsupervised Classification of Seismic Trace Shape To Create Facies Maps: Examples From The Australian North West Shelf

Presented by Jim Dirstein, Total Depth Pty Ltd (FESWA-ASEG Seminar, October 11th, 2000)

The concept of tying seismic facies with well information, and predicting lithology away from the wells using seismic facies maps is well known. However, seismic facies maps traditionally result from a process of visually recognising the reflection patterns in the seismic data and classifying them into descriptive classes such as continuous, sigmoidal, discontinuous, hummocky, transparent etc. This process is painstakingly slow and interpretative.

The maps are manually drawn and are subject to change from interpreter to interpreter. Using neural networks, the unsupervised classification of an interval in a 3D survey can rapidly map the progressive change of the shape of the wiggle traces. As seismic traces contain all relevant attribute information such as reflection patterns, phase, frequency, amplitude etc., the trace shape is a fundamental property of the seismic data. A map showing the distribution of similar trace shapes is like a facies map showing geologic features. This trace shape distribution map can be defined as a 'seismic facies map'.



Once a seismic facies map is created it can be made into a geologic facies map if well information is available, or by predicting the geologic facies from sequence stratigraphic and other geologic considerations. The importance of using seismic data as a start for

a geologic facies map is that such a map gives the overall variability of the facies.

The presentation showed several seismic facies maps derived from 3D data intervals from the Australian North West Shelf.