Interpretation

Using all available data (wells, seismic, outcrop, regional studies, gravity, magnetics, etc.) build a framework of present-day structure and stratigraphy

- Structural Interpretation
  - Faults & Folds
  - Subsidence & Uplift
  - Structural Trends
  - Structural Features

- Stratigraphic Interpretation
  - Unconformities
  - Stratal Packages
  - Environments / Facies / Lithologies
  - Ages

Seismic Interpretation

Determine the local geology from the subsurface images

- Map faults and other structural features
- Map unconformities and other major stratal surfaces
- Interpret depositional environments
- Infer lithofacies from reflection patterns & velocities
- Predict ages of stratal units
- Examine elements of the HC systems

Reflector Character and Geometry

Continuous reflector truncating short ones

Faults are discontinuities of the reflectors
Isochron map of reflector-1: Isochron = two way time

Average velocity map of reflector-1

Depth map of reflector-1

Synthetic
The Perils of a Seismic Section in Time

Would you drill this anticline? Bond et al. 2007
The Perils of a Seismic Section in Time

The same section in depth

The anticline does not exist in the depth section. It is a "velocity pull-up" created by fast rocks above it.

3D Seismic Block

3D Interpretation

Seismic Image of Ancient Reef in Alberta [400 million years old]

Relate features seen in seismic to stratigraphic or structural processes

3D Interpretation

Fancier stuff: Ant tracking of salt domes for fracture detection

Uses computer technology to visualize seismic data
Variance Attribute: Trace to trace variability in 3D seismic block

Patchesawra Surface flattened at 1.752 sec

Take Home Ideas

- Seismic Reflectors
  - Resolution Limited to 10’s of meters
  - Areal Coverage
- Time domain versus Depth domain
  - Well to Seismic Ties
  - Velocity Model
  - Convert TWT to Depth
  - Avoid Velocity effects
- Seismic Interpretation Provides Earth Image
  - Structure and Stratigraphy