

Perceptive Interpreter Training: Integrating Structural Insights, Volumetric Tools and Spatial Thinking

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Completing accurate 3D structural interpretations can be challenging even for expert structural geologists with years of experience. General geologists, especially novice interpreters, are even more likely to struggle. Short project timelines, variable data quality, and difficult software all add pressure, often resulting in inadequately addressed (or incorrect) reservoir structure maps or 3D models.

Developing efficient interpretation skills has often relied on individual skills and direction. Classic training provides important structural concepts, analog examples, and software skills, but commonly does not address the integration of these with accurate perception of the structural geometry in 3D. Compared to other fields and industries, geology lags in deliberately selecting for and developing volumetric skills and applications.

At ConocoPhillips we have developed a new interpreter training program that targets the integration of concept, tools, and cognitive skills. By infusing structural geology concepts with 3D spatial thinking exercises, trainees appreciate and visualize ranges of admissible 3D deformation geometries for a given structure or concept. As individual concepts are introduced in training courses, the blending of theory and 3D form hones spatial cognizance skills that are needed to produce accurate subsurface structural interpretations. This style of on-the-fly 3D visualization of geologic forms in many ways captures the essence of geologic field mapping, wherein hiking to elevated vantage points empowers the field geologist to visualize, update, and re-interpret the geologic forms he/she is mapping (e.g. mapping intersecting folds in a mountainous thrust belt).