The GeoMorpher Process Applied To Seismic Data, Or How To Make Your Seismic Show What You Want

By Nick Hoffman (Vic/Tas Branch, August 1999 Luncheon Meeting)

Geophysicists have often joked about the 'structural filter' in seismic processing which would enable them to add or remove anticlines as required. Now that filter is available, courtesy of a detour through Hollywood and the digital magic of image morphing. The same technology that can turn a frog into a prince can also work wonders for your seismic sections.

The technique of 'GeoMorphing' is described in the August issue of the SEG journal *'Leading Edge'* and has a very significant potential to improve the way we interpret faulted and structured seismic sections. The method allows us to remove and restore all the faults and deformation associated with structural movement and to see the geology of the prospect as it was before the fault or fold moved. By looking at the detailed correlation of seismic events, the image of geological horizons, we can detect extremely subtle lateral facies variations and thickness changes that would otherwise be unnoticed. The confidence in horizon identification and the amount of interpretable information is dramatically improved by using this simple technique.

The value of this approach will be demonstrated with dramatic 'before and after' pictures of thrust folds, salt diapirs and normal faults, all restored to undeformed geometries. Movies of structures being built will be played before your very eyes. Hopefully everyone will learn some new and surprising things about seismic data and what we can do with it in the digital age.

Biography

Nick Hoffman has worked in the Petroleum industry for 15 years, the last eight of these with BHP Petroleum in Melbourne where he worked on exploration projects in Asia, Australia, and worldwide. Nick's expertise is with interpretation methodology, structural geology, basin analysis and prospect risking. He also has key expertise in non-seismic geophysical methods and with image processing.

Nick is now at La Trobe University in Melbourne working with the Australian Geodynamics Co-Operative Research Centre.

PESA News No. 41 (1999)