

# CREWES NEWS

*The Consortium for Research in Elastic Wave Exploration Seismology*

## GMA International Software Donation

CREWES would like to thank GMA International for the recent donation of their GMAplus integrated exploration software system. This system includes "STRUCT" for structural modelling, "2D" and "3D" for seismic interpretation, "PetroSolv" for petrophysical analysis, "LogM" for log modelling, "AVO" for AVO analysis, and "WavX" for wavelet extraction.



Software donations such as these are of tremendous value to CREWES. They allow us to maximize our research resources by focusing our spending on supporting staff and students while maintaining up-to-date computing capabilities. In return, software companies benefit when CREWES students learn how to use commercial software and take that knowledge with them when they start working in the industry.

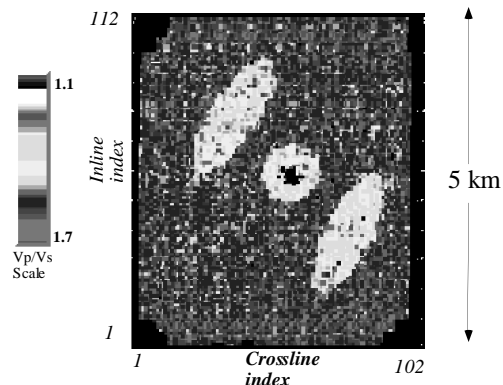
GMA International is a Calgary-based geophysical software company founded in 1982. More information about the company and their products can be found on their Website at: [www.gmacalgary.com](http://www.gmacalgary.com)

## Acquisition, Processing, and Interpretation of P-P and P-S 3-D Seismic Data

*Note: This is the abstract of Glenn Larson's M.Sc. thesis, which was presented in December of 1996. The entire thesis is available on the CREWES Website: [www.crewes.ucalgary.ca/Theses/Larson/](http://www.crewes.ucalgary.ca/Theses/Larson/)*

Three-dimensional (3-D) seismic images have become an essential tool in seismic exploration. The interpretation tools and practices for conventional (acoustic) 3-D developed over the past 20 years have become established techniques in oil and gas exploration.

Converted-wave 3-D (3C-3D) seismic images can accompany a conventional acoustic survey and provide a powerful adjunct toward



The Vp/Vs map of a clastic model, from the base of the Fish Scales to the Mannville interval.

a more complete interpretation. Proper design schemes are considered here to account for the nature of 3-D converted-wave recording without compromising either the acoustic or elastic data.

3-D converted-wave surveys are acquired over a carbonate and clastic numerical model. Extra elastic-wave information (e.g. Vp/Vs values, P-P and P-S amplitude maps) allows further characterization of the clastic and carbonate anomaly.

A 3C-3D seismic survey acquired in central Alberta is analyzed. The inclusion of the P-S data allow the construction of Vp/Vs and delay-time maps for the slow and fast shear-wave polarization. Vp/Vs mapping displays an anomaly in the Viking interval which suggests a higher percentage of sand.

The clastic model is based upon the Viking formation of central Alberta. Viking sand P-wave velocities (Vp) are similar to the adjacent shales in the Western Canada Sedimentary Basin, making conventional seismic exploration difficult.

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## Student Profile: Dan Vetrici

Dan joined CREWES in 1993 and is currently working on his thesis with Dr. Robert Stewart. He received an M.Sc. in geophysics from the University of Bucharest, Romania (1972). Since then, he has worked in Romania, Germany, Canada and Libya.

Dan's main interests are the Devonian Carbonate System in northeastern British Columbia, 3-D seismic interpretation, and image processing. His current research is focused on the use of seismic attributes to characterize hydrocarbon reservoirs, converted wave interpretation and time slice processing.



Recent publications - CREWES Research Report Volume 8, 1996: "3-D seismic attributes."

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