

# The Eighth International Williston Basin Symposium

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## The Eighth International Williston Basin Symposium

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Participants in the Williston Basin Symposium share an interest in this cratonic basin that provides consider-

able hydrocarbon wealth to Manitoba, Montana, North Dakota and Saskatchewan. The eighth symposium of this title was held 18-21 October 1998 at the Delta Regina Hotel in Regina, Saskatchewan. It attracted 340 registrants despite the lower oil prices that have been in effect for a while. Scientific contributions to the symposium are drawn from staff in oil and gas companies, government geological surveys, and universities. One of the pleasant aspects of this meeting is that there are no concurrent sessions and so registrants get to hear a broad range of talks and have ample time to view posters and exhibits.

The meeting was preceded by field trips to Manitoba and Montana. The Manitoba trip was led by Ruth Bezys (Manitoba Department of Mines and Energy) and Hugh McCabe, formerly of the same organization. The Montana field trip was led by Don Kent (D.M. Kent Consulting). These field trips were pushing the weather envelope for field trips in northern North America in the Fall but both were reported to be excellent. I can personally attest to the excellence of the Montana field trip, which visited the Bears paw Mountains and the Little Rocky Mountains in northern Montana. The Little Rocky Mountains outcrop area, although relatively small, affords a look at virtually the entire stratigraphy encountered in the subsurface. It is an extremely worthwhile destination for anyone interested in the Williston Basin.

The scientific program featured 29 oral presentations and 31 posters. Much of the interest in the oral session was focussed on the Ordovician Red River play. The papers included an excellent talk by Tom McClellan (Westport Oil and Gas) and Richard Gaber (Swift Energy Co.) on how horizontal drilling has "awoken a sleeping giant" by greatly improving recovery from the Cedar Hills Field, Bowman County, North Dakota. Other talks on the Ordovician dealt with facies recognition and reservoir development in the Red River Formation. A paper by Martin Fowler (Geological Survey of Canada) and others provided details on the Ordovician petroleum system of southeastern Saskatchewan, pointing out the presence of kukersite sources that have given rise to oil discovered in the Yeoman Formation of the Midale area, Saskatchewan. This interest in the Ordovician and the underlying Cambrian was also reflected in the core session, where cores from the

Cambrian Newporte and Ordovician Bowman fields of North Dakota and the Ordovician Midale field of southern Saskatchewan were displayed and ably interpreted by Mike Hendricks (Hendricks and Associates), Ward Whiteman (Burlington Resources), and Lyn Canter (Applied Geoscience Inc.), respectively. In addition, cores from the Middle Ordovician Winnipeg Group of North Dakota were displayed by Robert Vinopal (Standard Geological Services).

A second focus of the meeting was on the Devonian of the Williston Basin. In the oral sessions Don Kissling (Jackalope Geological Ltd.) described the intricacies of carbonate-evaporite cycles in the Duperow Formation and their contribution to stratigraphic traps in the northern part of the basin. Brian Pratt provided detailed description of an Upper Devonian patch reef in the Jefferson Formation of the Little Rocky Mountains, Montana. Of particular interest among the Devonian papers was that presented by Vern Stasiuk (Geological Survey of Canada) and others on a new technique for examining hydrocarbon migration in the Upper Devonian Birdbear Formation of southern Saskatchewan. The technique uses fluorescence microspectrometry of hydrocarbon fluid inclusions and entrapped oil globules to evaluate hydrocarbon migration. Different types of oil inclusions have been identified based upon visible light fluorescence properties and their distribution has been mapped, resulting in a better understanding of the distinctive oil types in the region hosted within the Birdbear Formation. The Devonian Bakken Shale was the subject of an oral paper given by Jürgen Schieber (University of Texas at Arlington) who described lag deposits within the Late Devonian Chattanooga Shale as potential sequence boundaries. He presented preliminary results of a similar nature from the Bakken Formation. Two of the core sessions were focussed on the Devonian part of the succession: one by Katherine Bergman (University of Regina) on the Middle Devonian Ratner Formation and one by Don Kent (D.M. Kent Consulting) on stromatoporoid banks in the Birdbear and Duperow formations of southern Saskatchewan.

A luncheon talk on the first day of sessions was given by the Chief Scientist of the Geological Survey of Canada, Dr. Richard Grieve, who spoke eloquently on the relationship of impact

structures and hydrocarbon accumulation in the Williston Basin. Some of the details of this talk were also presented in the poster session.

The second day of talks began with a series of papers on the Mississippian part of the Williston Basin. These included a description and wide-ranging discussion and of karst features in Mississippian rocks in the Williston Basin by Don Kent (D.M. Kent Consulting) and others. This session also included a talk by Steve Tedesco (Atoka Geochemical Services) on the application of geochemistry of soils (in this case iodine concentrations) to explore for reservoirs in the subsurface. This complemented a talk given earlier by Colin Dunn (Geological Survey of Canada) on a similar method of tracking subsurface reservoirs from surface geochemistry. This approach to hydrocarbon exploration is inexpensive but its efficacy remains controversial.

A significant number of talks dealt with hydrogeology of formation waters. These included talks by Adam Benn (University of Alberta) who described a regional data base of hydrochemistry of formation waters from the Cambrian through Devonian in the Williston Basin. The data base has been used to demonstrate distinct hydraulic flow regimes. Ben Rostron (University of Alberta) described the hydrogen and oxygen isotopic composition of formation waters from the same interval in southern Saskatchewan, and its potential importance for tracing petroleum migration pathways and for fingerprinting sources of contaminant water encountered during exploration and production of hydrocarbons. Dan Barson (Rahkit Petroleum Consulting) presented a review of how hydrodynamics can produce tilted oil/water contacts and described a number of case histories.

A paper on the thermotectonic history of the basin given by Kirk Osadetz (Geological Survey of Canada) generated considerable interest. It described spatial and temporal variations in apatite fission-track thermochronology and organic maturity data: for example, the oil window over the North American Central Plains Conductivity Anomaly was shown to be significantly elevated. In addition, a significant resetting of fission tracks is related to a Permian thermal event. The implications of this type of analysis are important to understanding the generation of hydrocarbons

throughout the basin.

Some highlights of the poster session included news of the forthcoming release of the Manitoba Stratigraphic Database (MSD) presented by Ruth Bezys and Glenn Conley (Manitoba Mines and Energy). The MSD includes stratigraphic data from oil and gas wells, government stratigraphic coreholes, mineral exploration diamond drill holes and many more. In a similar vein, Kim Kreis and Fran Haidl (Saskatchewan Energy and Mines) unveiled the new Lower Paleozoic Map Series for Saskatchewan. Both of these should be valuable resources for those working in the Canadian part of the Williston Basin.

One of the great aspects of the Williston Basin Symposium is that the symposium volume is available at the time of the meeting. This impressive-looking hard cover volume contains abstracts and full papers on the topics dealt with in the oral and poster sessions. The volume includes 48 titles, about half of which are full papers, and the rest are single-page or extended abstracts. The volume is edited by Jim Christopher, Chris Gilboy, Doug Paterson (all of Saskatchewan Energy and Mines), and Stephen Bend (University of Regina) and is published as Special Publication 13 of the Saskatchewan Geological Society (ISBN 0-921547-24-2). It is available for sale for \$70.00 from the Saskatchewan Geological Society, PO Box 234, Regina, Saskatchewan S4R 1J5.

The Williston Basin Symposium is one of those rare venues in which a wide diversity of geoscientists including consultants, government scientists, academics, students and industry explorationists mingle. The result is a conference of broad interest, and the prospects for rapid transfer of knowledge and technology among all the different facets of geoscience are high. The importance of shortening the innovation cycle is undeniable and this kind of conference works extremely well toward that end.

*(Corporate Support, continued from page 184)*

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