

## **Assessing patterns of dissolved methane in groundwater aquifers in the Stellarton basin**

**K Taylor**

Department of Earth Sciences, St. Francis Xavier University, Antigonish, Nova Scotia, Canada.

Previous studies of areas with high potential for hydrocarbon extraction attempt to understand baseline hydrological conditions in select areas throughout North America. There was found to be a strong correlation between methane in groundwater with increased proximity to gas wells, with dissolved methane detected in approximately 60% of all wells. Previous baseline groundwater testing in Nova Scotia observed generally low concentrations of methane with the anomalies not corresponding closely to Nova Scotia's coal fields with thermogenic methane signatures or wetland areas with biogenic methane signatures. Based on the results of this study, methane in well water was determined to originate from a range of sources including both biogenic, thermogenic and a mix of both. One area of interest with large data gaps that was identified was the Stellarton Basin. This area had a high percentage of methane detects compared to the rest of the province, but with low confidence due to the low number of samples. The methane source in the Stellarton Basin region is likely to be thermogenic due to the coal strata of the formation, which can be proven by isotopic analysis. The purpose of this research is to gain more understanding of the elevated dissolved methane concentrations found in groundwater in the Stellarton basin aquifers, determine methane signatures and contribute further knowledge to baseline datasets. A subset purpose of this project is to determine a new methodology of measuring methane gas using a headspace equilibrium technique with a flow-through cell.