

# EVALUATING THE SEQUENCE STRATIGRAPHIC RELATIONSHIPS, LITHOFACIES AND PETROPHYSICAL PROPERTIES OF THE SILURIAN REEFS FOR THE PURPOSE OF CCUS AND EOR IN THE MICHIGAN BASIN

Matthew Rine

*Geosciences, Western Michigan University, Kalamazoo, Michigan*

[matthew.j.rine@wmich.edu](mailto:matthew.j.rine@wmich.edu)

Silurian (Niagaran) reefs are significant hydrocarbon reservoirs in the Michigan Basin, having produced over 500 MMBO and 2.9 trillion cubic feet of gas. The creation of static geological models that incorporate sequence stratigraphic interpretations and detailed facies enhance the understanding of the spatial distribution, and possible controlling mechanisms, of reservoir properties. Understanding the relationships between petrophysical properties and the geological controls on the spatial distribution of these flow units are the fundamental inputs for three-dimensional static earth models. The reef reservoir will be subdivided into flow units based on the determination of pore types and most importantly pore throat size distribution. Capillary pressure data (from Mercury Injection Capillary Pressure Tests) and porosity/permeability- $r_{35}$  analysis will help to identify pore throat size distribution for different depositional facies identified in core. The subdivided flow units will then be cataloged and correlated to geophysical log signatures to help populate the static model where core is not available. The Michigan Geologic Research Team have been participants in the Midwestern Regional Carbon Sequestration Partnership (MRCSP) consortium since 2005 and have provided the Partnership with ongoing data about the potential for safe, efficient, and economically viable Carbon Sequestration in the subsurface strata of Michigan. This ongoing reservoir characterization and static modeling will be used for dynamic fluid flow modeling of the Niagaran Reefs which are the current targets for the CO<sub>2</sub> EOR project currently underway in Otsego County, Michigan.

AAPG Search and Discovery Article #90249 © 2016 AAPG Foundation 2015 Grants-in-Aid Projects