CO_2 Sequestration Potential of the North Michigan Silurian Reef Trend, Brian Toelle, Chaoqing Yang, and Tracee Imai, Schlumberger Data & Consulting Services, Pittsburgh, PA, toelle1@slb.com

The Northern Silurian Reef trend of the Michigan Basin was developed within the stratigraphic unit historically referred to as the Niagaran Brown. Within the past few years this unit was renamed the Guelph Formation. Over 700 reefs make up this trend, with some of these being over 300 acres in size and having produced more than 5 MMBbl of oil. Estimates of the total amount of hydrocarbons produced for the entire trend have been reported as high as nearly a half a billion barrels.

The U.S. Department of Energy has funded a study of an ongoing enhanced oil recovery project being conducted on a reef within this trend using the injection of CO_2. The Charlton 30/31 reef, located in Otsego County, like many other reefs in the play, was discovered and developed during the 1970's and 1980's. This field has completed its primary production phase, during which six wells produced 2.6 million of the field's estimated 7 million barrels of oil in place. This reservoir is characterized as a low porosity, low permeability limestone matrix with irregular dolomitized intervals providing a secondary network of higher porosity and permeability, which controls fluid flow throughout the reservoir. The estimated average porosity in this reef is just slightly over 6 percent. As part of this study the reservoir attributes identified at the Charlton 30/31 reef were extended to the entire Northern Reef Trend in order to determine its CO_2 sequestration capacity. Additionally, the potential oil recovery has been estimated.