3D Porosity Distribution in The Oriskany Formation in PA
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Abstract

The Oriskany formation, known for its historical use as a natural gas producing field, has recently gained significance due to its potential in CO2 storage and sequestration, which is crucial for meeting net-zero emission goals by 2050. This research involved an extensive literature review and analysis of existing findings to understand the formation’s properties better. Subsequently, a modern model and various porosity maps were developed to enhance porosity comparisons. Although the model is in a work in progress, it shows promising potential for future advancements and insights in this subject.

Objectives

The goals were simple:
- Study what has been written, observed, and recorded on the Oriskany.
- Progress on creating a literature review.
- Create a modern model that expresses the thickness and total porosity, starting within just PA.

Background

The Oriskany has been discussed for over 80 years, initially used as a producing field of natural gas, but it has now received closer analysis for the past 30 years. Its interest lies minimally in CO2 storage and its implications for CO2 sequestration, aligning with the modern goal of achieving net-zero emissions by 2050.

The most important observations were solidified by Roen and Walker (1996), providing a detailed explanation of the Oriskany in four main sections called Gas Plays, which describe the reservoir properties. This change in approach and vocabulary for discussing the formation was prompted by some significant differences found. Unfortunately, many authors tend to discuss the Oriskany as a whole, which can lead to inappropriate perspectives on the abilities of each play. These varying values are presented in the tables below:

Many of the most elaborate and useful pictorial demonstrations come from Kostelnik (2009), bottom left, and from Carter (2010), which can be seen below:

Results & Conclusions

In conclusion, the average porosity values obtained were 0.03 with a standard deviation of 0.08. While there may be challenges in comparing these results to others, it underscores the significance of discussing the Oriskany formation in terms of Gas Plays. By recognizing the distinct properties of each play, a more accurate understanding of the reservoir’s potential can be achieved.

What was Done...

- Possibly the first 3D model of the Oriskany!
- It shall aid those who seek to solve issues surrounding the gas storage, sequestration, and anything on the topic of the Oriskany!