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Presentation Outline: Marcellus Shales

I. Introduction to the topic.

* Appalachian basin contains an unconventional play in the Marcellus Shale.
  + Marcellus shale contains vast quantities of natural gas.
  + Natural gas resides in the source shale, not in a typical trap.
    - Development of fracking allowed gas to be produced economically.
  + Deposited about 390 Mya.
  + Largest Natural Gas Reservoir in U.S.
* Formation of basin
  + Acadian foreland basin
    - Fold-thrust load basin
  + Created as Avalonian microplate impacted Laurentia.

II. State of the problem or technique(s) addressed in the article.

* Well outputs vary from 1 to 10 mmcf/day.
  + Well outputs vary for several reasons, including completion style, reservoir quality, structural variation, and the placement and length of the well.
  + Understanding the subsurface facies can lead to understanding of the variable production rates.
    - Understand facies by building a picture of the depositional environment through sequence stratigraphy.

III. Methodology

* Focus on building framework around Union Springs member
* Usage of Gamma Ray data to identify lithology
  + 23 outcrops, 8 core samples, 1000+ wireline logs
* Usage of sub-Onondaga unconformity as datum
* Usage of ash layers to aid correlation.

IV. Results

* Built 7 well-log correlations
  + 3 for underlying Onandaga member
  + 4 for Union Springs formation
* Associated rock type and depositional sequence with base level changes in basin

V. Conclusion and Summary

* Union Springs member of Marcellus Shales is one third-order depositional sequence
* Contains 10 parasequences
  + Sequence created by regional base level change
  + Parasequences created by local base level change
* Same depositional sequence structure can be seen in other Marcellus Formation members (Purcell Member)

Video Link: <https://www.youtube.com/watch?v=mA0Ob0Nci4c>