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## Seismic Responses to Variations in Marcellus Shale, PA

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# Introduction

Ph.D. student at Jackson School of Geosciences  
(Enrolled in Fall 2010)

## My Education :

- ❑ Bachelor of Science in Geology from University of Dhaka, Bangladesh (Graduated November 2008).
- ❑ M.S. in Petroleum Geology and Geophysics from University of Dhaka, Bangladesh (Graduated August 2010).

## Past Research :

- ❑ M.S. thesis:  
Seismic interpretation and modeling of Rashidpur gas field for deciphering structure, tectonics and hydrocarbon potentiality. (Data and technical support was provided by Petrobangla).
- ❑ Project work:  
Groundwater evaluation in NW Bangladesh using shallow seismic and resistivity method.

# Present Research Interest:

## Seismic Responses to Variations in Marcellus Shale

### Motivation

- ❑ Prospect of Marcellus:  
“the Marcellus Shale weighs in with more than 500 trillion cubic feet of gas in-place spread over a four state area” ( Engelder, Terry & Lash, Gary G. , May 2008 ,The American Oil and Gas Reporter)
- ❑ Previous works on Marcellus Shale:  
Some Geologic studies have been done for resource evaluation. However, Geophysical research for resource evaluation is rare.
- ❑ Geophysical works on Marcellus Shale from EDGER Forum:  
M.S. thesis, Robert Brown, Sensitivity of the Seismic Response in the Productive Regions of the Marcellus Shale.

## Work Plan (Intention):

- ❑ Use 3D seismic data and well-log data.
- ❑ Characterization of fractures and cracks.
- ❑ Anisotropic modeling for VTI, HTI and Orthorhombic cases.
- ❑ Modeling of seismic parameters for thickness variations, gas content differentiations, pressure gradient variations and fracture distribution variations of Marcellus shale in prospective areas.

## Research Goal :

- ❑ Improve production scenario
- ❑ Reduce uncertainty for production
- ❑ Determine the extent to which natural fracturing will help production.

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