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GIS Technology: A Pathway for Regional Geospatial Analysis of Coalbed Methane Assessment and Future Energy Resource Development

Published and unpublished studies on coalbed methane potential in the northern Appalachian Basin suggest significant gas resources are present. Nonetheless, exploitation of this energy source has been limited in part by economic constraints, but primarily by inadequate data on regional geospatial characteristics of individual coal beds in specific regions of the basin, e.g. Ohio. Recent coal assessment studies and a geologic CO₂ sequestration investigation have resulted in digital stratigraphic databases that form the framework for a GIS analysis of individual coal beds for methane potential in the Ohio portion of the northern Appalachian Basin.

Numerous parameters can affect the content and distribution of methane in coal beds. Some of these constraints include but are not limited to: 1) coal bed structure, 2) coal geometry 3) coal isopachs, 4) coal ash content, and 5) roof rock lithotypes. Using ArcGIS software, statewide maps of individual coal beds illustrating these parameters can be produced in a relative rapid manner. Likewise, individual data layers can be overlain and queried in a GIS to determine and illustrate areas most favorable for coalbed methane recovery in Ohio.

Concerns about atmospheric concentrations of CO₂ have recently increased. Injection of CO₂ to enhance future coalbed methane recovery may also serve as a process to sequester CO₂.