Mapping the Regional Organic Thickness of the "Marcellus Shale," Hamilton Group

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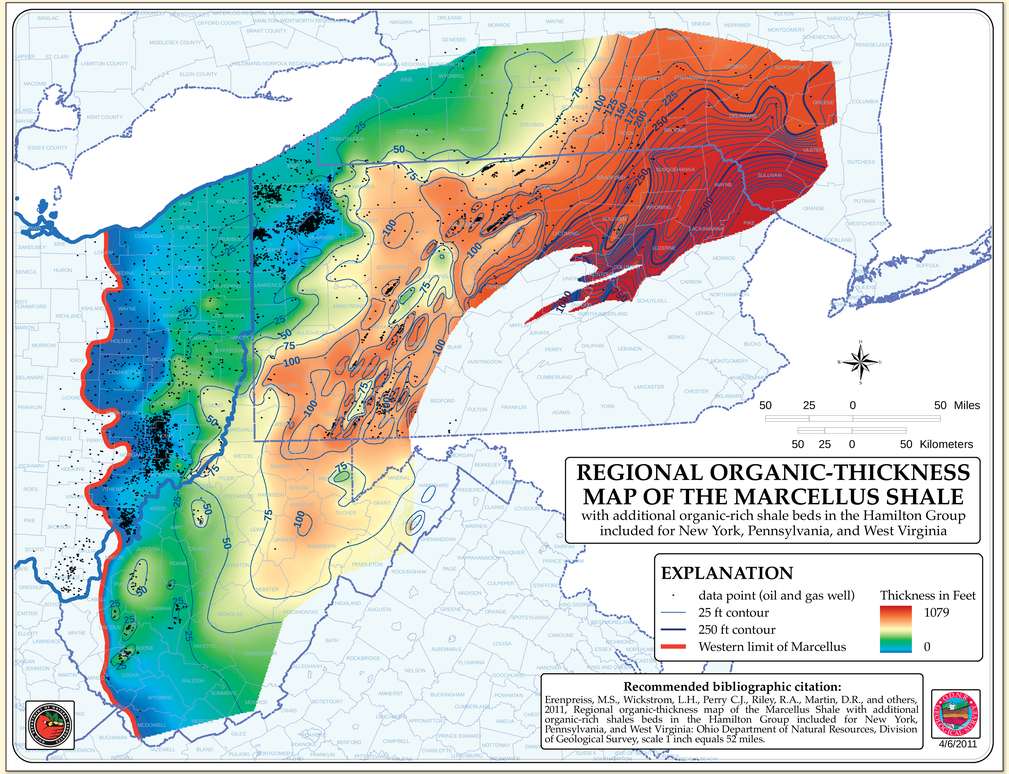
ABSTRACT • Regional and statewide isopach maps have been developed for the Middle Devonian "Marcellus Shale" for use in assessing Ohio's shale gas potential. Existing stratigraphic analyses of Devonian shales in Ohio were used as the starting dataset, which was expanded with additional geophysical logs that span the "Marcellus Shale" in each county and township, where available; this approach allowed for an even distribution of control points and more consistent correlations. This correlation expansion of the Hamilton Group, "Marcellus Shale," and Onondaga Limestone was based on U.S. Geological Survey cross sections published in Bulletin 1909. Using this newly compiled data and observing the "Marcellus Shale" upper and lower units, net organic thickness was calculated and contoured. Additional data was also collected from the state geological surveys of New York, Pennsylvania, and West Virginia to create a new regional map of organic thickness of the "Marcellus Shale."



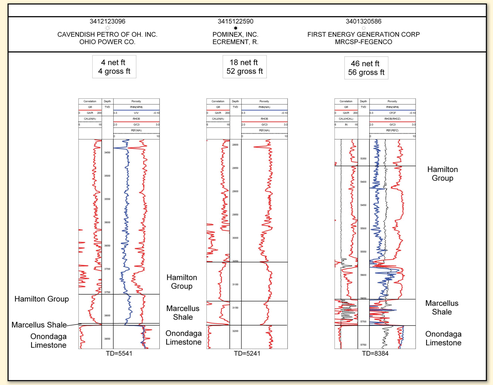


FIGURE 1.—Three "Marcellus" type logs from across Ohio. Some areas of the state only have a single unit just above the Onondaga Limestone, while others have multiple "Marcellus" units, some bifurcated and others continuous.

FIGURE 2.—Map of Ohio showing geographically the two sections A–A' and B–B', shown in figures 3 and 4 below.

REFERENCES

Lash, G.G., and Engelder, Terry, 2011, Thickness trends and sequence stratigraphy of the Middle Devonian Marcellus Formation, Appalachian Basin—Implications for Acadian foreland basin evolution: AAPG Bulletin, v. 95, no. 1, p. 61–103.

Ohio Division of Geological Survey, 1988, Analysis of stratigraphic and production relationships of Devonian shale gas reservoirs in Ohio–Final report October 1985–November 1988 (prepared for Gas Research Institute): Ohio Department of Natural Resources, Division of Geological Survey, 49 p., 15 pl.

Pennsylvania Geological Survey, [2010], Net feet of organic-rich shale in the Middle Devonian Marcellus Formation in Pennsylvania: Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey, map, last accessed September 21, 2011, at <http://www.dcnr.state.pa.us/topogeo/oilandgas/Marcellus_Net_Feet_Map.pdf>.

Roen, J.B., and Kepferle, R.C., 1993, Petroleum geology of the Devonian and Mississippian black shale of eastern North America: U.S. Geological Survey Bulletin 1909.

West Virginia Geological Survey, 2010, Thickness/isopach map (lines)—Marcellus Shale, West Virginia: Morgantown, West Virginia Geological and Economic Survey, vector digital data, last accessed September 21, 2011, at <http://www.wvgs.wvnet.edu/www/datastat/devshales.htm#DownloadMarcellus>.

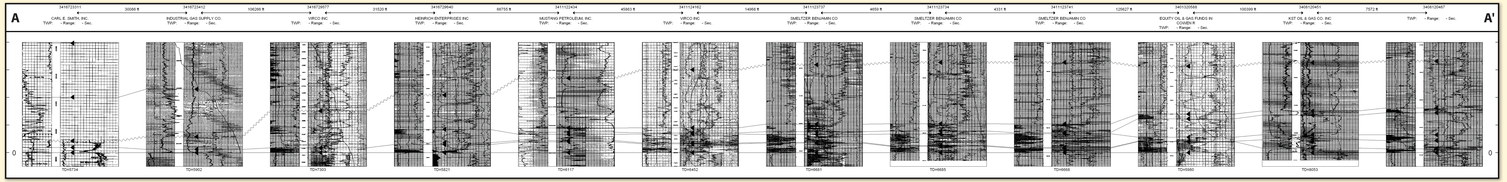


FIGURE 3.—Section A–A' shows how the "Marcellus Shale" thickens moving north along the Ohio River and how it can have bifurcated units in some areas.

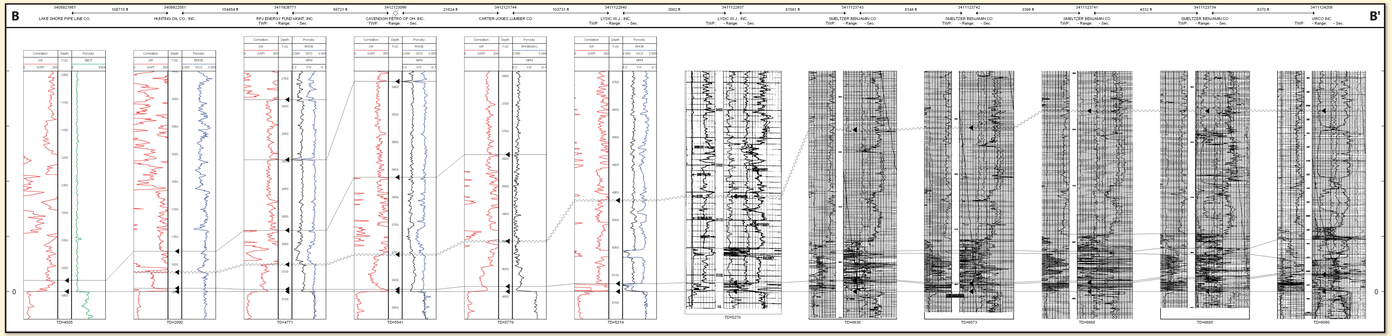


FIGURE 4.—Section B–B' shows how the "Marcellus Shale" thickens moving southeast from Licking County to the Ohio River in Monroe County.

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