



David R. Blood

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724-469-0324

AAPG Certified Petroleum Geologist # 6393

EDUCATION

A.S. Liberal Arts and Sciences: Mathematics and Science, May 2001: State University of New York, Jamestown Community College, Jamestown, New York.

B.S. Geology, May 2003: State University of New York College at Fredonia, Fredonia, New York.

M.S. Geology, December 2006: State University of New York, University at Buffalo, Buffalo, New York.

Thesis Title: The burial, thermal maturation, and fracture history of the Upper Devonian Rhinestreet Shale, western New York State.

EXPERIENCE

Senior Geologist, EQT Production, Pittsburgh, PA

October 2013 – January 2019

As part of the Reservoir Technology Group, responsibilities include the basin-wide petrophysical evaluation of the company's major development plays and exploration projects. These projects include the Lower Huron through Berea system in the Big Sandy field and the Marcellus Shale and Utica Shale. Further work has included evaluating depositional environments and basin dynamics, gas isotope geochemistry, sequence stratigraphic architecture, and chemostratigraphy of the Marcellus, Lower Huron and Utica shales and the Big Lime limestone as they pertain to reservoir development.

Chief Geoscientist, Pure Earth Resources, Sharpsville, PA

August 2011 – September 2013

Responsible for the technical evaluation of international and domestic unconventional resource plays. Technical evaluation includes regional trend mapping and basin architecture to smaller scale prospecting and development optimization using the application of petrophysics, sequence stratigraphy, chemostratigraphy, and organic and inorganic geochemistry.

Petrophysicist, EQT Production, Pittsburgh, PA

April 2009 – August 2011

As part of the Reservoir Technology Group, responsibilities include the basin-wide petrophysical evaluation of the company's major development plays and exploration projects. These projects include the Lower Huron through Berea system in the Big Sandy field and the Marcellus Shale and Utica Shale. Further work has included evaluating depositional environments and basin dynamics, gas isotope geochemistry, sequence stratigraphic architecture, and chemostratigraphy of the Marcellus shale, Lower Huron shale, and Utica shale as they pertain to reservoir development.

Geologist, Chesapeake Energy, Charleston, WV

December 2006 – March 2009

Responsibilities included petrophysical, structural, stratigraphic, and facies analysis of black shales, specifically the Marcellus shale, Lower Huron shale (and its Appalachian equivalents), the Rhinestreet shale, and to a lesser



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extent, the New Albany shale, and Utica shale. Also, responsibilities included re-evaluation and development of the Ordovician Queenston tight gas sand play in the Finger Lakes region of New York, and associated petrophysical and stratigraphic analysis of shallow marine to fluvial deltaic deposits, in addition to working the Oriskany sandstone and Trenton-Black River plays in New York and Pennsylvania.

Geology Intern, Chesapeake Energy; Charleston, WV

May 2006 – December 2006

Helped in the evaluation of black shales, and determination of behind pipe reserves in Upper Devonian sands of northern West Virginia. Duties also included picking formation tops via drill cuttings at the wellsite.

Adjunct Professor, Department of Science, Engineering, Mathematics, and Technology, State University of New York, Jamestown Community College; Jamestown, NY

January 2004 – May 2006

Courses taught include: Physical Geology (4 CH), Earth Science (3 CH), Catastrophic Weather (1 CH), Geologic Hazards (1 CH)

Lecturer, Department of Geosciences, State University College, Fredonia, New York

August 2004 – May 2005

Courses taught include: Catastrophic Weather and Climate Change (1 CH), Trembling Earth (1 CH)

CONTINUING EDUCATION

Sedimentology, sequence stratigraphy and reservoir architecture for paralic deposits (Nautilus)
Applied subsurface geologic mapping (Nautilus)
Comparative anatomy of Devonian shale plays in the Appalachian, Illinois, and Michigan basins (PTTC)
Fracture in Devonian black shale of the Appalachian Basin (PTTC)
Appraising and developing coalbed and shale gas reservoirs (PTTC)
Integrated Approaches of Unconventional Reservoir Assessment and Optimization (HGS)

RESEARCH GRANTS

SUNY Fredonia – Academic Affairs Undergraduate research/Creativity Grant, April 2002 (one year): “Depth of burial of Upper Devonian strata, western New York Appalachian Plateau”; \$440.

SUNY Fredonia Summer Undergraduate Fellowship, May 2002 (one year): “Role of organic carbon content on hydraulic fracturing of the Upper Devonian Dunkirk shale, western New York”; \$4,000.

SUNY Fredonia Summer Undergraduate Fellowship, May 2003 (one year): “The Upper Devonian Dunkirk Shale – A Dynamic Seal in the Appalachian Basin”; \$4,000.



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American Association of Petroleum Geologists Grants-In-Aid Donald A. and Mary O'Nesky Grant, May 2006 (one year): "Quantification of seal capacity of the Upper Devonian Rhinestreet shale, Western New York State"; \$1,250.

AWARDS AND RECOGNITION

1999 American Museum of Natural History Young Naturalist Award for the paper entitled "Depositional Environments and Fossils of the Late Devonian Catskill Delta"

Academic Award in Geology, May 2001, State University of New York, Jamestown Community College.

Susan J. Mara Scholarship, February 2003, presented by The Fredonia College Foundation.

Kenneth H. Weaver Student Grant Award, March 2005.

Energy Minerals Division's Frank Kottowski Memorial Award (Best Paper), May 2013 for Lash, G.G., and Blood, D.R., 2012, "Molybdenum, Uranium, and Chloride Abundances in the Marcellus Shale – Significance to Basin Hydrography and Organic Matter Preservation" presented at the American Association of Petroleum Geologists National Meeting, Long Beach, CA, April 2012.

Eastern Section American Association of Petroleum Geologists' A.I. Levorsen Memorial Best Paper Award, September 2017 for Blood, D.R., 2016, "Redox conditions during deposition and early diagenesis of the Upper Ordovician Point Pleasant Limestone of southwestern Pennsylvania and northern West Virginia; Insights from pyrite framboids and trace elements" presented at the Eastern Section, American Association of Petroleum Geologists meeting, Lexington, Kentucky, September 26th, 2016.

Pittsburgh Geological Society's award for Best Presentation on Appalachian Geology, September 2017, for Blood, D.R., 2016, Redox conditions during deposition and early diagenesis of the Upper Ordovician Point Pleasant Limestone of southwestern Pennsylvania and northern West Virginia; Insights from pyrite framboids and trace elements: presented at the Eastern Section, American Association of Petroleum Geologists meeting, Lexington, Kentucky, September 26th, 2016.

Energy Minerals Division's Ralph L. Miller Best Paper Award, October, 2018 for Blood, D.R., 2017, Deposition, Diagenesis and Hydrocarbon Generation in the Ordovician Point Pleasant Limestone and the Devonian Marcellus Shale: Comparing and Contrasting Two Appalachian Basin Unconventional Reservoirs: presented at the Eastern Section, American Association of Petroleum Geologists meeting, Morgantown, West Virginia, September 26th, 2017.

Pittsburgh Geological Society's award for Best Presentation on Appalachian Geology, October 2018, for Blood, D.R., 2017, Deposition, Diagenesis and Hydrocarbon Generation in the Ordovician Point Pleasant Limestone and the Devonian Marcellus Shale: Comparing and Contrasting Two Appalachian Basin Unconventional Reservoirs: presented at the Eastern Section, American Association of Petroleum Geologists meeting, Morgantown, West Virginia, September 26th, 2017.

Energy Minerals Division's Frank Kottowski Memorial Award (Best Paper), May 2019 for Blood, D.R., "Controls on Reservoir Development in the Ordovician Point Pleasant Limestone and Devonian Marcellus Shale: Comparing and Contrasting Two Appalachian Basin Unconventional Reservoirs" presented at the American Association of Petroleum Geologists National Meeting, Salt Lake City, UT, May 2018.

SOFTWARE/HARDWARE COMPETENCIES



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- Geographix software by Landmark/Halliburton with emphasis in PRIZM log analysis
 - Interactive Petrophysics by Senergy

SERVICE CONTRIBUTIONS

Served as president of the SUNY Fredonia Geology Club (2002-2003 academic year)

Membership in Professional Organizations:

- American Association of Petroleum Geologists 2005 – present
- Pittsburgh Association of Petroleum Geologists 2007 –present
- Appalachian Geological Society 2007-present
- Ohio Geological Society 2009 – present
- Society of Petrophysicists and Well Log Analysts 2008-present
- Geological Society of America 2009 – present
- Society of Economic Paleontologists and Mineralogists 2016-present
- American Association of Petroleum Geologists Division of Professional Affairs 2018- present

Chair/Convener professional meetings:

- Fieldtrips Committee Chair for the 2018 47th Annual AAPG-SPE Joint Eastern Section Meeting
- Speaker Committee Co-Chair for the 2019 Unconventional Resources Technology Conference Workshop Pittsburgh, PA, April 16th, 2019

Co-Chair/Convener professional meetings theme:

- Global Unconventional Resources theme of the 2013 National Meeting of the American Association of Petroleum Geologists

Co-Chair/Convener professional meetings session:

- Eastern Shale Gas, Condensate, and Oil sessions of the 2011 Eastern Section Meeting of the American Association of Petroleum Geologists
- Lower Paleozoic Unconventional Plays of the Northeast US (EMD/AAPG) sessions of the 2013 National Meeting of the American Association of Petroleum Geologists
- Geology of Marcellus-Utica Shale and how it Relates to Oil and Gas Production session of the 2017 Joint 52nd Northeastern Annual Section/51st North-Central Annual Section Meeting of the Geological Society of America
- Advances in Mudstone and Organic Matter Depositional Processes (EMD/AAPG) session of the 2017 National Meeting of the American Association of Petroleum Geologists
- Unconventional Plays session of the 2017 46th Annual Meeting of the Eastern Section American Association of Petroleum Geologists
- Unconventional Systems of the Western United States (EMD/SEPM) session of the 2018 National Meeting of the American Association of Petroleum Geologists
- New Geochemical Approaches for Understanding Fossil Fuel Systems from Deposition to Recovery session of the Mineral and Energy Resources theme of the 2018 Goldschmidt Conference
- Technical Advancements in Unconventional Exploration session of the 2018 47th Annual AAPG-SPE Joint Eastern Section Meeting
- Unconventional Plays: Appalachians, Rockies, and Midcontinent session of the 2019 American Association of Petroleum Geologists Annual Meeting and Convention
- Aligning Geoscience and Engineering Workflows session of the 2019 Unconventional Resources Technology Conference Annual Meeting



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Geological field trips lead:

- Buffalo Association of Professional Geologists, Fall, 2005.
- 78th Annual New York State Geological Association Meeting/American Association of Petroleum Geologists Eastern Section Meeting, Fall, 2006.
- 83rd Annual New York State Geological Association Meeting, Fall, 2011.
- American Association of Petroleum Geologists National Meeting, Spring, 2013.
- 47th Annual AAPG-SPE Joint Eastern Section Meeting, Fall, 2018.

Abstract reviewer for professional meetings:

- 2013 American Association of Petroleum Geologists Annual Convention and Exhibition
- 2017 American Association of Petroleum Geologists Annual Convention and Exhibition
- 2018 American Association of Petroleum Geologists Annual Convention and Exhibition
- 2019 American Association of Petroleum Geologists Annual Convention and Exhibition
- 2019 Unconventional Resources Technology Conference

Grant Proposal reviewer for:

- Petroleum Research Fund (American Chemical Society)

Book Proposal reviewer for:

- Wiley/American Geophysical Union

Manuscript reviewer for:

- Fuel

SYMPOSIA PARTICIPANT

National Meeting of the American Association of Petroleum Geologists – EMD/AAPG Unconventional Research Group Meeting; presented the paper “Application of hand-held XRF to finding sweet spots in shale plays (ex. Marcellus Shale)”, May 2013.

Unconventional Resources Technology Conference – Post Conference Operators Forum: Appraisal and Development of Unconventional Reservoirs; presented the paper “The application of new technologies to wellbore and field optimization in the Marcellus Shale, Appalachian Basin, USA”, July 2015.

American Association of Petroleum Geologists Pittsburgh Playmakers Forum - Presented the paper “Evaluation of a Marcellus Development Program – The Importance of Adaptation”, April 2016.

Petroleum Technology Transfer Council/Environmentally Friendly Drilling Workshop: Learning from Shales: Applying New Technology to Old Plays; co-authored the paper “Shallow Oil Exploration: Berea, Weir and Big Lime Horizontal Drilling in Kentucky and Virginia”, May 2016.

National Meeting of the American Association of Petroleum Geologists – EMD/AAPG Unconventional Research Group Meeting; co-authored and presented the paper “Moveable water in Appalachian Basin Shales: Preliminary evidence for a drilling and completion source”, May 2018.

PUBLICATIONS

Monograph Articles and Guidebooks



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Blood, D. R., 1999, The Catskill Sea: *Natural History* 7/99-8/99, p. 76.

Lash, G.G., and **Blood, D.R.**, 2005, *The Upper Devonian shale sequence of western New York State: some stratigraphic and structural considerations*: Buffalo Association of Professional Geologists, Fall 2005 Field Trip, 25 p.

Lash, G.G., and **Blood, D.R.**, 2006, *The Upper Devonian Rhinestreet black shale of western New York state – evolution of a hydrocarbon system*. In: *New York State Geological Association, 78th Annual Meeting Guidebook* (Ed. By R. Jacobi), p. 223-289.

Blood, D.R., 2011, Sequence Stratigraphy Key to Marcellus Lateral Placement, *American Oil and Gas Reporter Magazine*, August 2011, p52-60.

Lash, G.G., and **Blood, D.R.**, 2011, *Petrophysical properties of the Marcellus Formation as reflected in sequence stratigraphy*. In: *New York State Geological Association, 83rd Annual Meeting Guidebook* (Ed. By C. Ver Straeten), p. 49-60.

Zinn, C., **Blood, D.R.**, Morath, P., 2011, *Evaluating the impact of wellbore azimuth in the Marcellus Shale*, SPE 149468 8 p.

Lash, G.G., and **Blood, D.R.**, 2013, *Stratigraphy and Sedimentology of the “Other” Shales, Upper Devonian, Western New York State*: American Association of Petroleum Geologists National Meeting, pre-meeting fieldtrip, May 18th, 2013, 132 p.

Mendez, F.E., Siddiqui, A., Hanif, A., Longo, J., McGlynn, I., Gade, S., and **Blood, D.R.**, 2015, Detailed Mineralogy and Organic Carbon Detection Through Casing Using Pulsed Neutron Technology – A case Study in a Carbonate Formation (KY), SPE – 175775 – MS, 19 p.

Blood, D.R., and Lash, G.G., 2018, *FT-02: Stratigraphy and Sedimentology of the Upper Devonian Black Shales of Western New York State with Considerations for Unconventional Reservoir Development*: 47th Annual AAPG-SPE Joint Eastern Section Meeting, pre-meeting fieldtrip, October 7th, 2018.

Abstracts

Blood, D.R., and Lash, G.G., 2004, Framboid size distribution in black shale of the Upper Devonian Hanover, shale, western New York: evidence for fluctuations in the redox boundary: accepted for presentation at the Northeastern/Southeastern Regional Meeting, Geological Society of America Abstracts with Programs, vol. 36, pg. 89.

Blood, D. R., and Lash, G. G., 2005, Early origin of shale fabric by gravitational compaction of flocculated clay: accepted for presentation at the Northeastern Regional Meeting, Geological Society of America Abstracts with Programs, vol. 37, pg. 67.

Blood, D.R., and Lash, G.G., 2005, The Upper Devonian Dunkirk Shale- A Late Hydrocarbon Generator: accepted for presentation at the Northeastern Section Annual Meeting of the American Association of Petroleum Geologists, Abstracts Volume pg.17. Search and Discovery Article #90044

Zambito, J., Baird, G.C., and **Blood, D. R.**, 2005, Slickenside surfaces within K-Bentonite beds: a potentially sensitive tool for assessing the timing of far-field tectonic compression, volcanic ash illitization, and diagenetic ash cementation: accepted for presentation at the Annual Meeting, Geological Society of America Abstracts with Programs, vol. 37, pg. 67.



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Blood, D.R., and Lash, G.G., 2006, The Upper Devonian Dunkirk shale, western New York State – results of hydrous pyrolysis experiments: accepted for presentation at the 2006 Annual Convention, American Association of Petroleum Geologists, Abstracts Volume, vol.15, pg. 11. Search and Discovery Article #90052

Blood, D.R., and Lash, G.G., 2006, Calculation of the fluid retention burial depth for the Upper Devonian Rhinestreet shale, western New York State: accepted for presentation at the Eastern Regional Meeting, Geological Society of America Abstracts with Programs, vol. 38, pg. 64.

Blood, D.R., and Lash, G.G., 2006, Early burial history of the Upper Devonian Rhinestreet shale, western New York state – from early diagenesis to fluid retention: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists Meeting, abstracts volume, p. 15-16. Search and Discovery Article #90059

Lash, G.G., and **Blood, D.R.**, 2007, Origin of early overpressure in the Upper Devonian Catskill Delta Complex, western New York State: accepted for presentation at the American Association of Petroleum Geologists national meeting, Long Beach, CA, April 2007, abstracts volume, p. 80. Search and Discovery Article #90063/30049

Lash, G.G., and **Blood, D.R.**, 2010, Sequence stratigraphy and its bearing on reservoir characteristics of shale successions-examples from the Appalachian Basin: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists Meeting abstracts volume, p. 44-45. Search and Discovery Article #90116/40708

Douds, A.S.B., **Blood, D.R.**, and Willan, C.G., 2010, Regional sequence stratigraphic interpretation of the Marcellus Shale: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists Meeting abstracts volume, p.39. Search and Discovery Article #90116

Blood, D.R., 2010, Sequence stratigraphic control on lateral placement in the Marcellus Shale, Appalachian Basin: accepted for presentation at the AAPG/SPE/SEG/SPWLA Hedberg Research Conference "Critical Assessment of Shale Resource Plays", abstracts volume. Search and Discovery Article #90122

Douds, A.S.B., **Blood, D.R.**, and Willan, C.G., McCallum, S.D., 2011, Regional sequence stratigraphic interpretation of the Marcellus Shale: accepted for presentation at the Northeastern/ North-Central Sections, Geological Society of America Meeting, Abstracts with Programs vol.34, p.49.

Blood, D.R., 2011, Sequence stratigraphic control on lateral placement in the Marcellus Shale, Appalachian Basin: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Houston, Texas, abstracts volume, p.20. Search and Discovery Article #90124

Lash, G.G., and **Blood, D.R.**, 2011, Sequence stratigraphy as expressed by shale source rock and reservoir characteristics – examples from the Devonian succession, Appalachian Basin: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Houston, Texas, abstracts volume, p.107. Search and Discovery Article #80168/90124

Blood, D.R., 2011, Sequence stratigraphic control on lateral placement in the Marcellus Shale, Appalachian Basin: accepted for presentation at the American Association of Petroleum Geologists Geoscience Technology Workshop, Baltimore, Maryland, abstracts volume.

Blood, D.R., and Lash, G.G., 2011, Chemostratigraphy of the Marcellus Shale: Insights into depositional environments and implications for play fairways: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists Meeting abstracts volume, p.26. Search and Discovery Article #90131



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Lash, G.G., and **Blood, D.R.**, 2011, Chemostratigraphic trends of the Middle Devonian Marcellus Shale, Appalachian Basin, preliminary observations: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists Meeting, abstracts volume, p.38. Search and Discovery Article #80198

Lash, G.G., and **Blood, D.R.**, 2012, Molybdenum, uranium, and chloride abundances in the Marcellus Shale-significance to basin hydrography and organic matter preservation: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Long Beach, California, April 2012. Search and Discovery Article #41044/90142

Blood, D.R., Lash, G.G., and Bridges, L.C., 2012, Depositional controls on horizontal wellbore placement in the Marcellus shale, Appalachian Basin: Insights from chemo- and sequence stratigraphy: accepted for presentation at the joint Geological Association of Canada and Mineralogical Association of Canada annual meeting, St. John's, Newfoundland, May, 2012. (Invited)

Douds, A.S.B., Willan, C.G., McCallum, S.D., and **Blood, D.R.**, 2012, Regional sequence stratigraphic interpretation of the Marcellus Shale: accepted for presentation at the joint Geological Association of Canada and Mineralogical Association of Canada annual meeting, St. John's, Newfoundland, May, 2012.

Bridges, L.C., **Blood, D.R.**, and Alexander, L.L., 2012, Geology of shale oil plays in North America, current and future; International Symposium on Shale Oil Resources and Exploration Technology, Wuxi, China.

Lash, G.G., and **Blood, D.R.**, 2013, Vigorous anaerobic methane oxidation in the Upper Devonian succession, western New York; Possible evidence for Devonian gas hydrates: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 2013. Search and Discovery Article #41201

Blood, D.R., and Lash, G.G., 2013, Biogenic silica in the Upper Devonian shale succession of the Appalachian Basin, USA: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 2013. Search and Discovery Article #90163/50864

Blood, D.R. and Lash, G.G., 2014, Geologic Evolution of the Marcellus Shale and its effects on reservoir architecture and production: accepted for presentation at the American Association of Petroleum Geologists Geoscience Technology Workshop: Marcellus and Utica Point Pleasant, Pittsburgh, Pennsylvania, June, 2014 abstracts volume. Search and Discovery Article #90228

Blood, D.R. and Lash, G.G., 2014, Dynamic Redox Conditions in the Marcellus Shale as Recorded by Pyrite Framboids-Implications for Reservoir Quality: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists meeting, London, Ontario, September 29th, 2014. Search and Discovery Article #90195

Blood, D.R., 2014, Application of chemostratigraphy to Geosteering: A case study in the Big Lime of eastern Kentucky, USA: accepted for presentation at the Society for Petrophysicists and Well Log Analysts Fall Topical Conference: Mineralogy and Elemental Composition: Measurement and Interpretation from Core, Cuttings and Logs, Sanibel, Florida, October 22nd, 2014.

Blood, D.R., Hanif, A., Siddiqui, A., Longo, J., Gade, S., and Mendez, F., 2014, Cased hole mineralogy characterization of the Big Lime Formation (KY): accepted for presentation at the Society for Petrophysicists and Well Log Analysts Fall Topical Conference: Mineralogy and Elemental Composition: Measurement and Interpretation from Core, Cuttings and Logs, Sanibel, Florida, October 22nd, 2014.

Blood, D.R., 2015, Using elemental data for accurate wellbore placement and geosteering in unconventional reservoirs: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Denver, Colorado, June 2014. Search and Discovery Article #90216/80470



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Blood, D.R., 2015, Application of Elemental data to Wellbore Placement, Completion, and Production: Examples from the Appalachian Basin, USA: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists meeting, Indianapolis, Indiana, September 22nd, 2015. Search and Discovery Article #90218

Stypula, M.J., **Blood, D.R.**, Douds, A.S.B., 2016, Elemental data collected in the Berea sandstone of eastern Kentucky: Applications to wellbore placement, horizontal ‘Chemosteering’ and completion strategy: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists meeting, Lexington, Kentucky, September 26th, 2016. Search and Discovery Article #90258

Blood, D.R., 2016, Redox conditions during deposition and early diagenesis of the Upper Ordovician Point Pleasant Limestone of southwestern Pennsylvania and northern West Virginia; Insights from pyrite framboids and trace elements: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists meeting, Lexington, Kentucky, September 26th, 2016. Search and Discovery Article #90258

Blood, D.R., Schlaegle, S., Hefferan, C.M., Muphy, M., Vazquez, A., 2016, Redox conditions during early diagenesis inferred from the mode and occurrence of pyrite in the Upper Ordovician Point Pleasant Limestone of southwestern Pennsylvania and northern West Virginia, Appalachian basin, USA: accepted for presentation at the Society for Sedimentary Geology-American Association of Petroleum Geologists Research Conference: Mudstone Diagenesis, Santa Fe, New Mexico, October 16th-19th, 2016. Search and Discovery Article #90283
(Invited)

Blood, D.R., 2017, Deposition and Diagenesis of the Upper Ordovician Point Pleasant Limestone, Appalachian Basin, USA: Insights into Organic Matter Production, Preservation, and Reservoir Development: accepted for presentation at the Joint 52nd Northeastern Annual Section/51st North-Central Annual Section Meeting of the Geological Society of America, Pittsburgh, Pennsylvania, March 19th-21st, 2017.

Blood, D.R., 2017, Redox Conditions During Deposition of the Upper Ordovician Point Pleasant Limestone, Appalachian Basin, USA: Insights into Organic Matter Production, Preservation, and Reservoir Development: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Houston, Texas, April, 2017.

Hefferan, C.M., Bandli, B.R., **Blood, D.R.**, Cunningham, R., Menasche, D.B., Rollett, A.D., Schlaegle, S.F., 2017, Synchrotron Based Tomographic Imaging of Shale: accepted for presentation at the American Institute of Mining, Metallurgical, and Petroleum Engineers Materials Science and Technology 2017 Meeting, Pittsburgh, Pennsylvania, October 9th-12th, 2017.

Blood, D.R., 2017, Deposition, Diagenesis and Hydrocarbon Generation in the Ordovician Point Pleasant Limestone and the Devonian Marcellus Shale: Comparing and Contrasting Two Appalachian Basin Unconventional Reservoirs: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists meeting, Morgantown, West Virginia, September 26th, 2017. Search and Discovery Article #90291

Douds, A.S.B., Stypula, M.J., and **Blood, D.R.**, 2017, An Interpretation of Core Derived Water Saturations Using Water Isotope Analysis: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists meeting, Morgantown, West Virginia, September 26th, 2017. Search and Discovery Article #90291

Dattilo, B., **Blood, D.R.**, Gilhooly, W.P. III, 2017, The origin and evolution of shell beds in Ordovician shales of southwestern Pennsylvania (Point Pleasant and associated units) and their implications for the preservation of organic carbon: accepted for presentation at the Eastern Section, American Association of Petroleum Geologists meeting, Morgantown, West Virginia, September 26th, 2017.



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Blood, D.R., Dattilo, B., and Song, L., 2017, Redox conditions during deposition of the Upper Ordovician Point Pleasant Limestone, Appalachian Basin, USA: Controls on the Accumulation of Organic Matter: accepted for presentation at the 129th Annual Meeting of the Geological Society of America, Seattle, Washington, October 22-25th, 2017. **(Invited)**

Blood, D.R., 2018, Controls on Reservoir Development in the Ordovician Point Pleasant Limestone and Devonian Marcellus Shale: Comparing and Contrasting Two Appalachian Basin Unconventional Reservoirs: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Salt Lake City, Utah, May 2018.

Douds, A.S.B., Stypula, M.J., and **Blood, D.R.**, 2018, Measured Water Saturations in Mudstones: Preliminary Evidence for the Introduction of Water Through Drilling and Completion Practices: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, Salt Lake City, Utah, May 2018.

Blood, D.R., 2018, Creating Giants: The depositional and diagenetic pathways to the Ordovician Point Pleasant Limestone and Devonian Marcellus Shale Unconventional Reservoirs: accepted for presentation at the 53rd Northeastern Annual Section Meeting of the Geological Society of America, Burlington, Vermont, March 18th-20th, 2018.

Douds, A.S.B., Stypula, M.J., and **Blood, D.R.**, 2018, Measured Water Saturations in Mudstones: Preliminary Evidence for the Introduction of Water Through Drilling and Completion Practices: accepted for presentation at the Geochemical Society's Goldschmidt Conference, Boston, Massachusetts, August 12-17th, 2018.

Blood, D.R., 2018, Controls on reservoir development in the Ordovician Point Pleasant Limestone and the Devonian Marcellus Shale: Comparing and contrasting two Appalachian Basin unconventional reservoirs: presented at the Geochemical Society's Goldschmidt Conference, Boston, Massachusetts, August 12-17th, 2018.

Blood, D.R., and Lash, G.G., 2018, Carbonate concretions in the Middle and Upper Devonian shales of the Appalachian Basin: Insights into origin, formation, and their effects on drilling efficiency: accepted for presentation at the 47th Annual AAPG-SPE Joint Eastern Section Meeting, Pittsburgh, Pennsylvania, October 7-10th, 2018.

Blood, D.R., and Lash, G.G., 2019, Carbonate concretions in the Middle and Upper Devonian shales of the Appalachian Basin: Insights into origin, formation, and their effects on drilling efficiency: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, San Antonio, Texas, May 19-22nd, 2019.

Blood, D.R., and Lash, G.G., 2019, The Significance of Framboid-Hosted Porosity in the Marcellus Shale of the Appalachian Basin, USA: accepted for presentation at the American Association of Petroleum Geologists Annual Convention and Exhibition, San Antonio, Texas, May 19-22nd, 2019.

Blood, D.R., Lash, G.G., and Cahill, T.E., 2019, Horizontal Targeting Strategies And Challenges: Examples From The Marcellus Shale, Appalachian Basin, Usa: accepted for presentation at the URTeC Workshop Pittsburgh, PA, April 16, 2019. **(Invited)**

Workshops

Blood, D.R., and Lash, G.G., 2013, Chemostratigraphy of the Marcellus Formation represented by the EQT J. Leeson #1 core, Doddridge County, West Virginia, USA: Insights into depositional environment and applications for hydrocarbon exploitation: presented at the Black Shale Core Workshop, American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 19th, 2013.



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Blood, D.R., Douds, A.S.B., and Lash, G.G., 2017, The Middle Devonian Marcellus and Genesee shales represented by the EQT J. Leeson #1 core, Doddridge County, West Virginia, USA: Insights into depositional environment reservoir architecture: presented at the Black Shale Core Workshop, American Association of Petroleum Geologists Eastern Section meeting, Morgantown, West Virginia, September 26th, 2017.

Blood, D.R., Douds, A.S.B., and Lash, G.G., 2018, The Middle Devonian Marcellus Shale represented by the EQT (Stone Energy) Matoushek #1 Core, Wayne County, Pennsylvania, USA: Insights into depositional environment and reservoir architecture: presented at the Black Shale Core Workshop, 47th Annual AAPG-SPE Joint Eastern Section Meeting, Pittsburgh, Pennsylvania, October 7-10th, 2018.

Refereed Journal Articles and Book Chapters

Lash, G. G. and **Blood, D. R.**, 2004, Depositional clay fabric preserved in early diagenetic carbonate concretion pressure shadows, Upper Devonian (Frasnian) Rhinestreet shale, western New York: *Journal of Sedimentary Research*, vol. 74 p. 110 – 116, <https://doi.org/10.1306/060103740110>.

Lash, G. G. and **Blood, D. R.**, 2004, Geochemical and textural evidence for early diagenetic growth of stratigraphically confined carbonate concretions, Upper Devonian Rhinestreet black shale, western New York: *Chemical Geology*, v. 206, p. 407-424, <https://doi.org/10.1016/j.chemgeo.2003.12.017>.

Lash, G.G., and **Blood, D. R.**, 2006, Insights into gravitational compaction history by strain analysis: example from the Upper Devonian of western New York State: *Northeastern Geology and Environmental Science*, v.28, p. 313-328.

Lash, G.G., and **Blood, D.R.**, 2007, Origin of early overpressure in the Upper Devonian Catskill Delta Complex, western New York state: *Basin Research*, v. 19, p. 51-66, DOI: 10.1111/j.1365-2117.2007.00318.x

Lash, G.G., and **Blood, D.R.**, 2014, Organic matter accumulation, redox, and diagenetic history of the Marcellus Formation, southwestern Pennsylvania, Appalachian Basin, *Marine and Petroleum Geology*, v. 57, p. 244-263. <http://dx.doi.org/10.1016/j.marpetgeo.2014.06.001>

Blood, D.R., and Lash, G.G., 2015, Dynamic redox conditions in the Marcellus Shale as recorded by pyrite framboid size distributions, *in* Larsen, D., Egenhoff, S.O., and Fishman, N.S., eds., Paying Attention to Mudrocks: Priceless!: Geological Society of America Special Paper 515, p. 153–168, DOI:10.1130/2015.2515(08).

Blood, D.R., Schlaegle, S., Hefferan, C.M., Vazquez, A., McAllister, D., in press, Diagenetic pyrite morphology in mudstones of the Upper Ordovician Point Pleasant Limestone, Appalachian Basin: Evidence for dysoxic deposition accepted for publication *in* Camp, W., eds., AAPG Memoir #.

Features

Lash, G.G., and **Blood, D.R.**, 2012, Molybdenum, uranium, and chloride abundances in the Marcellus Shale-significance to basin hydrography and organic matter preservation: Search and Discovery Article #41044/90142 Featured in AAPG Search and Discovery Digest Volume 3.2, January, 2013.

INVITED LECTURES

The occurrence and distribution of organic carbon in the Marcellus Shale: Appalachian Geological Society Quarterly Meeting (October 2010)



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On the origin of stratigraphically confined carbonate concretions of the Devonian black shales, Appalachian Basin: Pittsburgh Association of Petroleum Geologists November Meeting (November 2010)

Chemostratigraphy of the Marcellus Shale: Insights into depositional environments and implications for play fairways: Pittsburgh Association of Petroleum Geologists October Meeting (October 2011)

Organic and inorganic geochemistry of shales: insights into depositional environments: Beaver County Geological Society monthly meeting (September 2012)

From reservoir architecture to wellbore placement: The many uses of chemostratigraphy in understanding and developing oil and gas deposits: Back to the Future: Conversations with Science Alumni, SUNY Fredonia (October 2014)

Redox conditions during deposition and early diagenesis of the Upper Ordovician Point Pleasant Limestone of southwestern Pennsylvania and northern West Virginia: Pittsburgh Association of Petroleum Geologists September Meeting (September 2016)

From Fossils to Fuel: The Odyssey of an Oil and Gas Geologist: Muskingum University April 18th Geology Club Meeting (April 2017)

Being Wrong is the Key to Science: How Being Wrong Advances Knowledge: Examples in Petroleum Geology: St. Francis University Petroleum and natural Gas Engineering Seminar (October 2017)

Deposition, Diagenesis and Hydrocarbon Generation in the Ordovician Point Pleasant Limestone and the Devonian Marcellus Shale: Comparing and Contrasting Two Appalachian Basin Unconventional Reservoirs: Illinois Geological Society Meeting (December 2017)

Controls on Reservoir Development in the Ordovician Point Pleasant Limestone and Devonian Marcellus Shale: Comparing and Contrasting Two Appalachian Basin Unconventional Reservoirs: Ohio Geological Society Meeting (April 2018)

SUPERVISION OF GRADUATE THESES

Roy Sexton IV, West Virginia University, M.S., 2011; Thesis Title – “Sequence Stratigraphy, Distribution and Preservation of Organic Carbon, and Reservoir Properties of the Middle Devonian Marcellus Shale, of the Central Appalachian Basin; Northern West Virginia and Southwestern Pennsylvania”.

SUPERVISION OF GEOSCIENCE DEPARTMENT INTERNS

Travis Warner – (2009) EQT Production
Amanda Ulincy - (2011) Oxy
Liaosha Song – (2017) West Virginia University (PhD)

Margaret Walker Milani – (2010) Shell
Samantha Ritzer – (2016) Stanford University (PhD)

MEDIA

Interviewed for “A Rare Honor” by Traci Langworthy, The Jamestown Post Journal, May 23, 1999.



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Interviewed for "X-Ray gun gives drillers better shot at finding oil" by David Hunn, Houston Chronicle, September 2, 2016.

UNCONVENTIONAL RESOURCE EXPERIENCE

Marcellus Shale
Rhinstreet Shale
Maquoketa Shale

Utica Shale/Point Pleasant Limestone
Lower Huron Shale
Rogersville Shale

Geneseo Shale
Mowry Shale
Cleveland Shale