Geology; Studies from University of Texas Austin Describe New Findings in Geology (Trace-elemental and Petrographic Constraints On the Severity of Hydrographic Restriction In the Silled Midland Basin During the Late Paleozoic Ice Age)

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2021 APR 2 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- New research on Geology is the subject of a report. According to news reporting out of Austin, Texas, by NewsRx editors, research stated, "Enrichment of redox-sensitive trace elements in ancient marine shales is conventionally believed to be controlled by marine benthic redox conditions, whereas the influence of hydrographic conditions on trace element enrichment pattern has been rarely considered. Here, we present newly obtained data sets from the Upper Pennsylvanian organic-rich Cline Shale in the Midland Basin, Texas, to illustrate the influence of hydrographic circulation on the trace-element enrichment pattern and the stratigraphic record of mudrocks."

Financial supporters for this research include State of Texas Advanced Resource Recovery (STARR) program at the **Bureau of Economic Geology**, China Scholarship Council, Geological Society of America Graduate Student Research Grant, Firewheel Energy, LLC (Houston, Texas), media group at the BEG, Jackson School of Geosciences, The University of Texas at Austin.

Our news journalists obtained a quote from the research from the University of Texas Austin, "Various lithofacies, including siliceous mudrocks, argillaceous mudrocks, skeletal-bearing argillaceous mudrocks, calcareous mudrocks, and wackestone, are identified in the Cline Shale. Significant changes in the trace-element enrichment pattern, mineral composition, texture of framboidal pyrite, and other bulk geochemical parameters in different lithofacies are interpreted to have been caused by high-amplitude and high-frequency glacio-eustatic sea-level oscillations in the silled Midland Basin during the late Paleozoic ice age. Specifically, glacio-eustatic sea-level falls generally resulted in the severe isolation of the Midland Basin from the Panthalassic Ocean, highly restricted hydrographic circulation, long deep-water renewal time, euxinic bottom-water conditions, depleted seawater Mo (molybdenum) in the silled basin, and low sediment Mo/TOC (total organic carbon), coupled with significant extrabasinal detrital quartz input, forming siliceous mudrocks. Enhanced phosphorus cycling and excellent preservation conditions are considered to be responsible for the high TOC observed in siliceous mudrocks."

According to the news editors, the research concluded: "In contrast, glacio-eustatic sea-level rises substantially enhanced water exchange between the basin and the Panthalassic Ocean, created overall suboxic to anoxic bottom-water conditions, resupplied seawater Mo, elevated sediment Mo/TOC, and increased platform carbonate production in the basin, forming calcareous mudrocks and wackestone."

This research has been peer-reviewed.

For more information on this research see: Trace-elemental and Petrographic Constraints On the Severity of Hydrographic Restriction In the Silled Midland Basin During the Late Paleozoic Ice Age. Geological Society of America Bulletin, 2021;133:57-73. Geological Society of America Bulletin can be contacted at: Geological Soc Amer, Inc, PO Box 9140, Boulder, CO 80301-9140, USA.

Our news journalists report that additional information may be obtained by contacting Junwen Peng, University of Texas Austin, Jackson School of Geosciences, Bur Econ Geol, Austin, TX 78713, United States. Additional authors for this research include Qilong Fu, Toti E. Larson and Xavier Janson.

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