

## **An exceptional record of early- to mid-Paleozoic redox change from the Road River Group, Yukon, Canada**

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The extent to which Paleozoic oceans differed from Neoproterozoic oceans, and the causal relationship (if any) between biological evolution and evolving environmental conditions, is heavily debated. Here we build an expansive record of Paleozoic seafloor redox change from the upper Cambrian to Middle Devonian Road River Group of Yukon, Canada. The Road River Group represents an ideal sedimentary succession to investigate the long-term redox record because it provides a nearly continuous record of deep-water marine deposits over this time period.

More than 900 shale samples from the Road River Group and other Paleozoic shale units were analyzed for major- and trace-element geochemistry, iron speciation, TOC, and where appropriate,  $\delta^{98}\text{Mo}$ . Based on iron speciation data, late Cambrian and Early Ordovician anoxic water columns were often euxinic. In the Middle Ordovician to late Silurian, anoxic water columns were broadly ferruginous. A transition towards dominantly euxinic water columns occurred in the mid-Early Devonian. Thus these results demonstrate a long, ~60 Myr interval of the early Paleozoic characterized by ferruginous water columns, similar to the Neoproterozoic. Redox-sensitive trace metal abundances in this time period are similarly muted, suggesting either a global seafloor redox landscape similar to the Neoproterozoic or persistent sampling issues when euxinia is rare.