

## Effects of redox conditions on organic matter accumulation in the Mississippian Limestone, Anadarko Shelf, Oklahoma

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In order to evaluate whether hydrocarbons produced in the Mississippian Limestone play are externally- or self-sourced [1], conditions impacting organic matter accumulation, along with productivity and detrital input, are under investigation. This study utilizes a multiproxy approach to investigate the role of redox conditions on organic matter concentrations during the deposition of the Mississippian Limestone on the Anadarko Shelf, Oklahoma, USA.

Nitrogen isotopes ( $\delta^{15}\text{N}$ ) [2], total organic carbon (TOC), and concentrations of redox-sensitive trace elements (U, V, Mo, Ni, Mn, Cu) [e.g. 3] were measured on samples from two cores drilled in the Anadarko Shelf. The Mississippian Limestone interval is deeper in core 1 and TOC values in this core are between 0-2.5% with an average of 0.8% TOC. The Mississippian Limestone is relatively shallow in core 2 and TOC values in this core are between 0-2.1% with an average of 0.4% TOC.  $\delta^{15}\text{N}$  data from cores 1 (3‰ to 14‰, average 8‰) and 2 (2‰ to 10‰, average 7‰) indicate sediment deposition under oxic-suboxic water conditions. These depositional conditions are supported by trace element redox proxies indicating no enrichment relative to average carbonate [4]. Lack of correlation between TOC and redox trace element concentrations or  $\delta^{15}\text{N}$  (irrespective of lithology or sea level cycle) suggests that water column redox state during deposition was not a dominant factor governing organic matter accumulation in this area of the Anadarko Shelf at time of deposition.

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