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# Intra/interfacies-scale chemostratigraphic records from thick mudrock successions: an example from the Kimmeridgian of East Texas

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Mudrocks comprise an astounding percentage of the sedimentary cover of the planet, yet, surprisingly less is known about the various origins of and the paleodepositional/paleoenvironmental records held within mudrocks, as compared to other sedimentary rock types. One issue that arises in studies of many mudrock successions is the ability to properly trace stratigraphic changes across multiple drill cores or outcrops, due to the often nondescript, homogeneous nature of mudrock successions. However, technical advances in the field of x-ray fluorescence (XRF) have made possible the rapid, yet sensitive and precise, analysis of geological materials. Mudrock-specific elemental calibrations have been developed that encompass a wide range of mudrock chemistry.

Two chemostratigraphic records developed from drill cores recovered from the Kimmeridgian-age Haynesville Formation of the East Texas Basin will be presented. Each core is approximately 90 meters long, and was sampled at a ∼5-cm interval. The high-resolution sampling of such thick successions generates strikingly detailed records that direct subsequent sedimentological observations toward the intra- and interfacies-scale. Specifically, at the 5-cm scale of sampling, individual sedimentary packages can be separated, and their depositional origin and environmental significance are better evaluated. The major and trace element chemostratigraphic records from the two cores will be subdivided and assigned facies designations in an initial effort to evaluate chemo- and litho-facies variability in a formation that is visually rather homogeneous. This work will 1) help to better define lithological variability in a largely homogeneous succession, and 2) potentially provide improved linkages between the sedimentological and hydrographic conditions of specific paleoenvironments.