



Reconstruction of the Environment of Deposition of the Norphlet Formation in the Conecuh Embayment, Conecuh County, Alabama

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ABSTRACT

The Norphlet Formation is a Jurassic age siliciclastic unit overlying the Louann Salt and beneath the Smackover Formation within areas of Louisiana, Mississippi, and Alabama. The Norphlet Formation is known to be dominated by a broad desert plain stretching from east to west, rimmed to the north and east by the Appalachians and to the south by a developing shallow sea. The top of the Norphlet formed the surface for deposition of the overlying Smackover Formation. This surface was flooded by a rapid influx of marine water that were the environment of deposition for the carbonate units of the Smackover.

Four main lithofacies within the Norphlet were deposited in southwestern Alabama as a result of erosion of the southern Appalachians. The four lithofacies include: basal shales, conglomerates and conglomeratic sandstones, the Denkman Sandstone member, and a redbed succession. The conglomerates were deposited in coalescing alluvial fans in proximity to an Appalachian source. The conglomeratic sandstones grade downdip into red beds that accumulated in distal portions of alluvial fan. Playa lake sediments also accumulated in the interdunes areas allowing for deposition of evaporites associated with the Norphlet formation.

The aim of this research is to examine the Norphlet Formation within the Conecuh Embayment and reconstruct the paleo-environment at the time of deposition of the Smackover Formation. Norphlet sand dunes, salt flats, and alluvial fans were covered by the Smackover sediments through rapid transgression of marine waters with the opening of the ancestral Gulf of Mexico. Understanding the paleogeography will help in understanding the underlying sediments that may impact the deposition and alteration of the overlying Smackover.