

Compilation of Stratigraphic Thickness, Total Organic Carbon Values, and Source Rock Types Produced by Oceanic Anoxic Events (OAE) 1A, 1B, and 2 on the Atlantic and Gulf of Mexico Conjugate Margins

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ABSTRACT

Oceanic anoxic events (OAEs) are short-lived periods of global oceanic oxygen deficiency triggered by massive volcanic eruptions: OAE1A (Ontong Java Plateau eruptions, 122–124 Ma); OAE1B (Kerguelen Plateau eruptions, 93–94 Ma); and OAE2 (Caribbean Plateau eruptions, 93–94 Ma). These periods of volcanic eruptions are recorded stratigraphically by the conformable and global deposition on the world's passive margins of continuous intervals of dark gray to black, pyrite-rich shale with total organic carbon (TOC) contents ranging from 1–20%. Because these intervals are widespread and reach such high TOCs, they are considered some of the best and most prolific source rock intervals for hydrocarbon accumulations especially when inter-fingered with sandy, turbiditic reservoirs in deepwater, passive margin-type settings. We have compiled the extent and thickness using published wells that have penetrated “OAEs” from conjugate margins of the Atlantic and Gulf of Mexico. These sources show the OAE1 can vary in thickness from 100–1500 m with a TOC values in the range of 1.9–20%. OAE2 thicknesses range from 50–490 m with TOC values in the range of 2–10%.

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