

New Geologic Interpretations from Beneath the Chukchi Sea: Offshore Alaska, USA

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ABSTRACT

In the context of Shell's recent suspension of exploration activities in the Chukchi Sea and in the spirit of knowledge retention, we present some key details of Shell's regional geologic model for the US Chukchi Sea. Our model builds on the work of many predecessors, including those from the USGS and BOEM, and it comprises interpretations from modern 3D seismic data as well as re-interpretations of well data. We present a Devonian-through-Cenozoic tectono-stratigraphic evolutionary model that includes several previously under-reported elements and events. These include: regional Devonian orogenic collapse; Jurassic karst formation on the Crackerjack Ridge; rift-related Jurassic mafic submarine magmatism in the Burger area; regional Berriasian-Hauterivian foreland flexural uplift that produced the Lower Cretaceous unconformity; Neocomian salt withdrawal from the Popcorn Trough; Barremian contractional tectonism above the northern Hanna Trough; widespread Cenomanian uplift and erosion; extensive Maastrichtian-aged transpressional inversion that drove the formation of a regional anticlinorium beneath the central Chukchi Shelf and, among others, several stages of Paleogene transtensional collapse. Although we contend that the US Chukchi Sea is a prolific petroleum province, we don't discuss petroleum systems here; rather our focus is on observations and geologic interpretations that we hope will contribute to the understanding of the tectono-stratigraphic evolution of the Chukchi Sea and the wider circum-Arctic region.