

Is There a Subsalt Foldbelt in the Central U.S. Gulf of Mexico?

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The Oligo-Miocene Perdido foldbelt and late Miocene Atwater foldbelt are both detached on Louann salt, indicating that they were driven by Louann-detached extensional systems further updip. The foldbelts lie at the western and eastern ends of the Sigsbee Escarpment in the northern Gulf of Mexico, separated by a 300-km-wide gap in which no comparable foldbelt has been mapped. Is the absence of a foldbelt in the central U.S. Gulf of Mexico real, or a product of poor data quality? If a foldbelt exists, where might it be?

The Perdido and Atwater foldbelts are part of linked gravity-driven systems that are detached on autochthonous Louann salt. The Perdido foldbelt is the downdip equivalent of the Corsair extensional fault system, and the Atwater foldbelt is tied to growth of a series of stepped counterregional systems (including the Terrebonne Trough) in coastal Louisiana. Oligocene extensional systems similar in geometry to those driving the Perdido foldbelt are present beneath the inner shelf and onshore in the central US Gulf of Mexico. This suggests that a foldbelt should lie somewhere downdip.

Deeply buried compressional structures are abundant beneath the outer shelf in the central U.S. Gulf of Mexico, suggesting they may be toe structures accommodating the extension observed near the coast. If this foldbelt exists, it is further north than predicted from width-of-slope calculations. One explanation is that the foldbelt is localized above a step in the base of the Louann salt, which formed a buttress to seaward translation on the Louann detachment.