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A Dissected Triangle Zone in the Montana Thrust Belt: Clues to a New Exploration Play

Triangle zones are complex antiformal wedge structures that often form along the leading edges of foreland fold-thrust systems. These structures create ideal structural traps during tectonic expulsion of hydrocarbons from the interiors of orogenic belts. Triangle zones were first recognized in the Alberta Foothills in the 1970's. The Canadian Foothills triangle zone has been the focus of renewed oil and gas drilling since the mid-1990's, and has resulted in numerous Cretaceous pool discoveries in that province. The continuation of the Foothills triangle zone southward into Montana is obscured by thick glacial cover directly south of the border. However, a triangle zone is well exposed in Montana south of the glacial cover, along the west flanks of the Augusta and Adel synclines (the southern extension of the Alberta syncline).

The Auchard Creek culmination between the Augusta and Adel synclines has been dissected by tributaries of the Dearborn River, and reveals the internal structure of the Montana Triangle Zone. A balanced cross-section has been created along a SW-NE transect utilizing these surface exposures and existing well data. With ample mature source rock available in the Cretaceous Cone Calcareous member of the Marias River Shale (Turonian Greenhorn equivalent), the Cretaceous/Jurassic reservoir sands should be charged with hydrocarbons and trapped by the structures within the triangle zone. Little drilling has been done to date in Montana targeting these reservoirs. Since this play is well east of the controversial Federal lands along the Rocky Mountain Front, the area has the potential to become a major new exploration play in Montana.