

**AAPG Annual Convention  
Salt Lake City, Utah  
May 11-14, 2003**

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**Massive Accumulations of Methane Hydrate in the Aleutian Basin of the Bering Sea: Basin Analysis, Origin, and Resource Potential**

Localized velocity and amplitude anomalies (VAMPs) observed on seismic reflection profiles imply that the deep water Aleutian Basin (>3,500 m) is shallowly (400-450 m) underlain by massive (>50% of pore space) deposits of methane hydrate. VAMP pseudostructures are widely observed in a sequence of flat-lying turbidite and diatomaceous beds. VAMPs are characterized by vertical columns (1-3 km wide) of upward-arched horizons (velocity pull-ups) directly overlying a vertical series of downward-depressed horizons (velocity push-downs). A high-amplitude, negative polarity bottom simulating reflector (BSR) marks the beginning of the push-down, which extends downward with increasing deflection to at least 1000 m subseafloor. Above the BSR, the magnitude of the pull-up decreases toward the seafloor.

It is inferred that massive deposits of methane hydrate (pull-up) have accumulated in porous beds above a vertical column of ascending thermogenic gas (push-down). The gas chimney passes through undeformed but diagenetically contracted siliceous deposits of Miocene age. The 3-D geometry of VAMPs is unknown, but if the pull-up results from a simple cupola-shaped body of interstitial hydrate, and if the pushdown results from only a low concentration of gas (2%), the minimum basin-wide volume of methane at VAMP structures is at least 1000 TCF, much of which is methane hydrate. At a single large VAMP (30 ms pull-up, 80 ms push-down), the minimum volume of methane involved (hydrate and free gas) is that of a large gas field. Thousands of VAMP structures, fueled by warmed source beds in Miocene siliceous deposits, occur in the Aleutian Basin.