

Comparison of Two Gas-Hydrate Sites for Sea-Floor Monitoring

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ABSTRACT

Hydrates have been reported from two sites in Mississippi Canyon (MC): Federal Lease Blocks MC798 and MC118. These sites were examined by members of the Gulf of Mexico Hydrates Research Consortium as potential sites for a sea-floor installation to observe and monitor changes in the gas-hydrate stability zone. Common on the sea floor and in the shallow subsurface of continental slopes, hydrates of hydrocarbon gases represent a major potential energy resource. When changes in temperatures and/or pressures cause hydrates to dissociate into component gases and water, stability of the sea floor is threatened and concentrations of gases in sea water, and eventually the atmosphere, are altered.

MC798 and MC118 are remarkably different: MC798 is dominated by a minibasin on the slumped west flank of the Mississippi Canyon whereas MC118, approximately 65 miles (100 km) east of the canyon is located in a region largely unaffected by slumping. Several seismo-acoustic systems were used to survey the blocks and reveal contrasting subsurface structures; gravity and piston cores were analyzed for lithology, clay mineralogy, and foraminiferal biostratigraphy. In MC798, methane hydrates occur near a mud volcano and are apparently associated with near-surface muds; MC118 contains clear evidence of gas hydrates only locally. Sedimentation rates at MC798 were 3 to 7 times faster than those at MC118.