AAPG Annual Meeting
March 10-13, 2002
Houston, Texas

David C. Twichell[1], VeeAnn A. Cross[1], Mark Rudin[2] (1) U.S. Geological Survey, Woods Hole, MA (2) University of Nevada Las Vegas, Las Vegas, NV

Mapping Turbidites in Lake Mead from Source to Sink

Lake Mead provides a unique modern analog for studying the response of a complete turbidite system to known external forcing conditions. Although density flows have been observed in the lake since completion of the Hoover Dam in 1935 the deposits resulting from these flows had not been investigated. We mapped the surficial geology and architecture of these lake-floor deposits using sidescan sonar and high-resolution seismic data. The lake is divided into five major basins separated by narrow canyons. A delta fills the easternmost basin at the mouth of the Colorado River, but the existence of gas in the sediment precludes measuring the delta's thickness and internal structure. The western four basins are floored by as much as 40 m of post-impoundment sediment that fills only the deepest parts of the basins. Multiple packages of flat-lying reflectors separated by acoustically transparent zones and a flat surface characterize this fill. Reflector amplitude within individual basins is highest under the inferred axis of density flows and is weaker along the basin margins. High-amplitude reflectors observed in the subsurface of the western three basins presently are buried by mud, and only the basin most proximal to the delta has a sandy floor that is channeled. High-amplitude subsurface reflectors in the western basins suggest sand was transported farther west, but recently has been restricted to the eastern basin. Reduced river discharge since construction of the Glen Canyon Dam (1965) upstream of Lake Mead may be the cause of the sourceward shift of sand deposition.