trends at the slope–basin floor boundary. For example, population explosions of the oweniid *Myriochele* at the base of the slope suggests opportunism related to substrate instability. Significant macrofaunal populations are supported throughout this environment. Repeated disturbance by mass movements produces a downslope trend toward an infaunal, motile life habit.

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Sedimentary Processes Active on Slopes of California Borderland

The slopes of the California borderland are an important pathway for sediments transported from the mainland shelf, bank tops, and island platforms to the adjacent basin floor. Sedimentologic conditions on the slope are governed by a complex interplay of depositional and mass movement processes which are controlled by driving forces and stabilizing factors. Driving forces are predominantly external to the sediment mass and include oceanographic, biologic, and tectonic factors. Sedimentologic and geotechnical properties of sediments, as well as certain environmental parameters such as declivity, may provide a stabilizing influence to the sediments. These same factors, however, may be an influence in decreasing the stability and enhancing the influence of the driving mechanisms. Declivity, an environmental property commonly considered a major factor controlling failure, is less important than either proximity to active sediment sources or the influence of external driving forces.

We have conducted field studies at different scales of examination including high resolution acoustic profiling, sediment sampling, bottom photography, and observations from manned submersibles. These data show that failures themselves are greatly varied in scale, ranging from large features kilometers on a side and approximately 50 m thick, through smaller scale failures tens to hundreds of meters on a side, and about 1 m thick, to very small displacements composed of locally contorted and deformed sediment layers only a few centimeters thick.

We regard these small displacements as being more important in the basin filling process than has been previously recognized. In a detailed study of an acoustically defined failure zone on the mainland slope off San Mateo Point, we observed the zone itself to be composed of numerous narrow slumps. Cores from these deposits contain combinations of hemipelagic sediments and small-scale mass flow deposits exhibiting internal plastic deformation and basal scour. Vertical stacking of these sediment packets show that small-scale displacements can occur repeatedly at a given locality. Continued, episodic loading of the sediments through time produces locally inhomogeneous, weakened sediment masses which, in conjunction with driving forces, may contribute to the generation of large-scale failures. Such large-scale features are those commonly identified by conventional acoustic techniques.

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Intermargin of Southern California Borderland—Quaternary Tectonics, Seismic Stratigraphy, Sedimentation, and Evolution

No abstract.

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Petroleum Potential of Great Basin

The discovery in 1976 of Trap Spring oil field in Railroad Valley, Nevada, and the 1979 discovery of West Rozel oil field in the Great Salt Lake, Utah, have focused attention on the Great Basin. To date, five fields have been discovered which include, in addition to the mentioned fields, the Rozel Point (circa 1904), Eagle Springs (1954), and Currant oil fields (1978). All fields produce from either Tertiary lake sediments or fractured volcanic rocks. Accumulations occur in truncation-fault traps or in drape-over faulted structure.

Exploration for Tertiary hydrocarbon accumulations consists of (1) mapping basin source rocks with proper depth for maturity, (2) presence of good reservoir rocks, and (3) delineation of traps by photogeologic-geomorphic techniques, gravity surveys, and seismic shooting.

Wells drilled in many basins have recorded good shows of oil and gas both in Tertiary and Paleozoic rocks. Other oil and gas indications include the Bruffey oil and gas seeps (Pine Valley, Nevada), the Wells oil seep (west of Wells, Nevada), an asphaltite dike in Mississippian rock in the Pinon Range east of Pine Valley, and the West Brigham City and Farmington gas area (Carson Sink, Nevada). Oil source units include the various Cretaceous to Tertiary lake deposits (Sheep Pass Formation, Elko shale, Kinsey Canyon formation, Newark Canyon Formation, and King Lear Formation), Mississippian Chainman Shale, Devonian Pilot Shale, and Ordovician Vinnini shale.

In addition to Tertiary prospects, some Paleozoic plays exist, which include the Mississippian Diamond Peak (Illipah, Scotty Wash) sandstone facies change to the east into the Chainman Shale, occurring in central Nevada east of the Antler orogeny. Structural prospects exist in the Basin and Range province, with potential Paleozoic reservoirs. In addition, reef prospects may be present in the Silurian and Devonian of Nevada. Continued exploration for both Tertiary and Paleozoic prospects should result in significant discoveries of oil and gas.

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Sedimentologic History and Characteristics of Continental Margin Basins—California Borderland

Sediments are delivered to continental margin basins via several paths. Major process types are mass movement, turbidity currents, discrete particle settling, and nepheloid flow. Some are episodic, others are continuous, and all vary in rate and magnitude depending on distance from source, variations in climate and oceanographic conditions, relief of source terranes, and trapping or storage within the basin systems which are com-