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ASSOCIATION ROUND TABLE

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Abstracts of Papers

ARENDS, ROBERT G., Union Science & Technology Division, Brea, CA

Diatoms and Silicoflagellates From Holocene Sediments, Southern California Continental Borderland

Samples from five basins on the southern California continental borderland were examined for diatoms and silicoflagellates. These basins, Santa Monica, San Pedro, Santa Catalina, San Nicolas, and Tanner, represent a transect of approximately 85 nmi in a southwesterly direction across the continental shelf. The two nearshore basins, Santa Monica and San Pedro, contain the greatest species diversity and the smallest number of reworked specimens. Tanner basin, however, has the greatest abundance of diatoms and silicoflagellates in the study area, and the highest percentage of reworked specimens. The reworked diatoms are mid-Miocene to late Miocene in age. San Nicolas and Santa Catalina basin samples contained both lower species diversity and abundance totals than the other three basins. These two basins also contained a significant number of reworked diatoms.

As might be expected benthic species were common in Santa Monica and San Pedro Basins, however, a large number of benthic species were in the Tanner Basin samples, which was not expected. There was also a disproportionately low number of smaller planktonic diatoms in the sediments when compared to the very large numbers found in the phytoplankton standing crop in this area.

ARMENTROUT, JOHN, Mobil Oil Corp., Dallas, TX

Glaciomarine Depositional Environments and Biofacies, Yakataga District Continental Shelf, Gulf of Alaska

No abstract.

ATWATER, BRIAN F., and DANIEL F. BELKNAP, U.S. Geol. Survey, Menlo Park, CA

Holocene Intertidal Deposits of Sacramento–San Joaquin Delta, California

Rivers draining nearly one third of California reach sea level in the Sacramento–San Joaquin delta. Though tapered toward a constricted outlet and separated from the sea by a chain of estuarine bays and straits, the delta resembles deltas built into open-marine environments in that (1) its principal landforms—tidal wetlands and natural levees—are typical features of such delta, and (2) the fundamental process of deltaic deposition—discharge into standing water—affected the delta during historic floods. Tidal wetlands (marshes and swamps), generally served by fresh water, covered most of the delta (about 1,400 sq km) before agricultural reclamation. Rising sea levels began to create such wetlands at the site of the delta around 7,000 years ago. Continued sea level rise caused the wetlands to spread across flood plains of the Sacramento and San Joaquin Rivers, alluvial fans of lessor tributaries, and fields of eolian dunes. Once established, these wetlands built upward, apparently by accumulation of roots and rhizomes in growth position, to keep pace with sea level. Inorganic sediment largely bypassed the delta and settled instead in the brackish- and salt-water bays to the west. Accordingly, the typical vertical sequence of facies in the delta consists of intertidal peat overlying alluvium or dune sand. Principal exceptions are the sands and muds of channels, the silts of natural levees along distributaries of the Sacramento River, and the clays of tidal wetlands near these distributaries.

Major high stands of the sea during Pleistocene time should have produced intertidal peat at the site of the delta. The scarcity or absence of Pleistocene peat implies removal by streams, wind, exudation, and/or anaerobic decomposition. The latter three agents have removed Holocene peat from farmed, reclaimed wetlands of the delta as rapidly as 7 cm/year.

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Variables Affecting Trench and Trench-Slope Sedimentation Along Active Continental Margins

Studies of active continental margins show the diversity of sedimentation patterns in trenches and on trench slopes. Many variables produce a range of distinctive deposits on the seaward trench slope, the trench axis, and the landward trench slope which can be used to interpret modern and ancient depositional settings.

Deposits along the trench axis are often described as a trench wedge, but the geometry and volume of these deposits vary extensively. The volume is dependent upon a balance between the rate of plate convergence and the rate of sedimentation. Sedimentation rate is a function of many factors such as climate, onshore drainage patterns, sea level fluctuations, the width of the continental shelf, and the amount of sediment trapped in fore-arc basins or behind smaller tectonic ridges along the landward trench slope. Variations in the geometry of trench axis deposits are due to irregularities on the oceanic plate and to sediment transport systems. Turbidites from a single point source may build a massive fan or a long wedge via an axial channel, while a series of smaller submarine canyons may build a set of small fans or a chain of ponded basins.

Sedimentation along the landward trench slope depends on many of the same variables, particularly the size and spacing of canyons and the distribution of basins and ridges on the slope. An apron of hemipelagic muds may cover much of the slope, while locally slope basins receive terrigenous turbidites. Large deep can-