NOUS UNITS OF DETRITAL SEDIMENT, UPPER DEVONIAN, NEW YORK

Previously studied sedimentary environments and time-stratigraphic relations in the Sonyea Group (Upper Devonian) and adjacent units of New York provide an excellent framework for examining the effects of transport distance and environment of deposition on sediment composition and texture within an essentially isochronous unit of detrital sediment.

Samples for this study consist of 250 thin sections from 54 exposures and 12 environments of deposition, ranging from nonmarine to marine-slope and basin. Preliminary petrographic analyses reveal the following basinward trends: (1) fine-grained, foliated metamorphic rock fragments, a common constituent of the nonmarine sediments, are almost totally absent from sediments of the marine shelf, slope, and basin; (2) mean size of quartz grains ranges from fine sand in nonmarine environments to coarse silt in basin turbidites, whereas the maximum size ranges from granule to fine sand; (3) percentages of matrix range from 20% in nonmarine to over 80% in prodelta sediments; (4) rock fragments, including polycrystalline quartz, vary from 50% in nonmarine sediments to 4% in basin trubidites; and (5) monocrystalline quartz ranges from 23% in nonmarine sediments to over 40% in delta-front sediments.

In addition to these general trends, different sedimentary environments with similar mean sizes of quartz grains are distinguished on the basis of differences in petrology and size distributions of quartz grains. For example, fluvial floodplain, estuary, delta-channel, and delta-front environments, all having a very fine mean size of quartz grains, show significant differences in percentages of quartz, rock fragments, and matrix, or in the nature of the size distributions of quartz grains.

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JURASSIC PROXIMAL AND DISTAL CARBONATE TURBIDITES OF CENTRAL HIGH ATLAS MOUNTAINS, MOROCCO

The Lower Jurassic sediments of the High Atlas Mountains of Morocco were deposited in a northeast-southwest-oriented trough approximately 100 km wide and 800 km long. The trough margins are characterized by carbonate and marl shelf deposits, whereas the central, axial part is characterized by offshore, deeper water carbonates and marls. The depositional history of some of the deeper water sediments can be determined from a thick, carbonate, turbidite sequence flanking the southern High Atlas shelf. Within this section (800 m thick), it is possible to trace a sequence from proximal turbidites near the base through progressively more distal turbidites in the upper part of the section. Distinctive turbidite units are observed and, when lithology and unit geometry are traced up through the section, distinct changes can be recognized. There is a reduction in bed thickness and grain size, a change in intraclast types, and an increase in bedding regularity; well-developed laminae are more common and beds become well graded.

This turbidite sequence represents deposition from successive turbidity currents. The vertical changes from proximal to distal turbidites record either a deepening of the trough, a change in location of the sediment-source area, or a combination of both these factors.

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EPA REGULATIONS AFFECTING OIL INDUSTRY

No abstract available.

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LATE PALEOZOIC CLASTIC WEDGES IN APPALACHIAN PROVINCE

Late Paleozoic clastic wedges, arrayed from north to south along the western edge of the Appalachian tectonic welt, differ in age as well as spatial relations. The northern, Catskill, wedge is the oldest and apparently was derived from the north, whereas the succeeding Warrior-Arkoma wedge was apparently derived from a southern or Ouachita source. The youngest, Pocahontas and Dunkard, wedges are located between the older two and were derived from only a relatively small area in the central Appalachian Blue Ridge and Piedmont. Although the style of sedimentation differs among these large sedimentary prisms, all were governed by similar tectonic controls of differential subsidence and growth faulting. Significantly, the trend of tectonic complexes from which the sediments were derived is nearly at right angles to most of the present structures and suggests predrift tectonic connection.

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EROSIONAL ORIGIN OF INNER SHELF SEDIMENTS—EVIDENCE FROM NORTH FLORIDA

Study of 194 vibratory cores (4–20 ft long) from the Atlantic inner shelf off central and northern Florida indicates that most of the Holocene shelf sediments were derived from erosion and reworking of shelf substrata, and that direct fluvial contribution attending the last rise in sea level was negligible. Erodable, unconsolidated, and semi-lithified Tertiary and Pleistocene deposits are present in localized exposures or lie at shallow depths beneath the inner shelf surface in many places. All these older sediments contain ample quantities of fine to coarse quartz sand. Selective removal of the finer constituents of these older deposits, such as small Foraminifera, silt-size dolomite rhombs, and terrigenous muds, by erosion and reworking during Holocene transgression, can readily account for the veneer of fine to medium orthoquartzitic sand that mantles the inner shelf.

Progressive upward depletion of these characteristic fine constituents within the Holocene sand body is evidence of continuity with the underlying source strata. In addition, species of large, durable Foraminifera and phosphorite grains, both typically abundant in the Tertiary substrata, are present throughout the Holocene sand body. Although ultimately derived through the large Piedmont-drainage rivers in Georgia, the present shelf assemblage is indicative of mixed local sources. An erosional origin further explains the observed characteristics of the surface sediment: low feldspar, high phosphorite, and unstable heavy mineral assemblage, and pronounced rounding of quartz grains. In contrast, direct fluvial mechanisms of deposition do not account for such characteristics.

The last major rise in sea level was evidently a period of extensive erosion for the Atlantic shelf, in addition to being a transgression with discontinuous deposition as Curray has suggested.

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EVOLUTION OF SANTA BARBARA BASIN-WESTERN TRANSVERSE RANGES, CALIFORNIA

The modern Santa Barbara basin displays the east-west structural grain of the Transverse Ranges. Plate-tectonic theory suggests this grain evolved late in Tertiary time. However, Paleogene and early Neogene paleostructural and paleogeographic reconstructions suggest an Early-Middle Tertiary inception of the western Transverse Range province. Episodic diastrophism indicates that this evolution was also irregular.

Generally northwest-trending Paleocene shorelines in the eastern Santa Monica Mountains have been mapped by Campbell and Yerkes. This earliest Tertiary record is largely missing in the western Transverse Ranges, However, by middle to late Eocene time, a more westerly alignment is evidenced by the southward "flowing" proximal submarine fans of the Matilija