European usage of formation which often is actually a time-stratigraphic unit correlated across major facies changes.

Leg 9 of the Deep Sea Drilling Project recovered 1,500 m of core in eight sites (sites 77–84), a distance of 5,000 km, along the equatorial Pacific. Each site was cored to basement. Site 77 which was continuously cored 480 m was divided into several lithologic units that served as a standard of reference for Leg 9 sites. The consistent stratigraphic sequence and areal distribution of these lithologic units led to the adoption of four deep-sea formations: Line Islands Formation, Marquesas Formation, Clipperton Formation, and San Blas Formation. These formations are lithologically distinct, Tertiary, diachronous units that can be traced at least 4,000 km. The most useful and objective criteria to define these formations are color differences and to a lesser degree bedding characteristics. Color variations often are accompanied by textural, mineralogic, and biotic changes which further aid in the characterization of these formations.

Description of deep-sea sediments in terms of lithologic units and the establishing, tracing, and dating of oceanic formations can provide an improved basis for understanding the interrelations among rock-stratigraphic and time-stratigraphic units, lithologic and biologic sedimentation patterns, depositional processes, and subaerial dispersal patterns. It can also improve communication between oceanographers and continental stratigraphers.

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STRATIGRAPHY AND PETROLOGY OF TYPE ESCONDIDO FORMATION (UPPER CRETACEOUS), MAVERICK COUNTY, TEXAS, AND ADJACENT COAHUILA, MEXICO

The type Escondido Formation (Rio Grande section) has an aggregate outcrop thickness of about 900 ft and is sandwiched between the underlying coal-bearing Olmos Formation and the basal tabular limestone beds of the Midway Group (Tertiary). The lower three fourths of the outcrop Escondido is calcitic mudstone and shale separated by several fine-grained quartz arenite to lithic subarkose sandstone layers. Lithology, sedimentary structures, and macro-invertebrate faunal assemblages suggest a bay-lagoon-barrier bar depositional system. The upper part of the Escondido (Cuevas Creek Member) is a lithosome of calcitic mudstone, siltstone, very fine sandstone, and muddy to silty, commonly glauconitic limestone. Recurrent molluscan assemblages and abundant burrow structures suggest deposition in an inner-shelf setting of shallow neritic depths.

Sphenodiscid ammonite assemblages in the Escondido historically have been correlated with the lower part of the standard Maestrichtian stage of Europe. The uppermost sphenodiscid zone in the Escondido [zone of *Sphenodiscus pleurisepta* (Conrad)] has not been conclusively defined in other parts of Texas, the eastern Gulf Coast, or northeastern Mexico; it may represent higher Maestrichtian.

The Escondido-Midway contact is sharp, consisting of ledge-forming limestone above and mudstone below. However, the Cretaceous-Tertiary boundary does not coincide exactly with the contact. The boundary lies in a thin transitional interval, showing successions of glauconite concentrations and discontinuous levels of pholad borings.

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NEW COMPONENT OF BRAIDED RIVER MODEL

During the late Wisconsin glacial retreat in southern Ontario, extensive sheets of braided gravelly and sandy outwash were deposited. In the Credit River valley, near Toronto, there are 2 overall fining-upward sequences of braided deposits, with gravels passing upward into sands. The gravels contain large-scale (up to 3 m) crossbedding and abundant channeling, suggesting deposition from migrating mid-channel braid bars. The sands contain some tabular crossbedding (sets up to 1 m), and also a distinctive, newly defined coarsening-upward lithofacies sequence.

The sequence begins with a thin (3–6 cm) layer of clay, which overlies abruptly on rippled sand. The clay grades upward into silty clay with faint wavy laminations, and some cross-lamination with preserved stoss sides. The silty clay grades upward into cross-laminated silt, and then ripple-drift cross-laminated sand with eroded stoss sides. The rippled sand is followed erosionally by trough crossbedded sands (sets up to 40 cm) resting in channels up to 1 m deep and 3 m wide. In places, these channels cut down to the basal clay layer. The uppermost part of the sequence consists of tabular and trough crossbedded coarse sands and gravels.

The coarsening-upward sequence is interpreted as the fill of an abandoned channel. The clay represents fines washed over a levee from an active channel in flood. As more material was washed in, gentle flow began and ripples were formed in silt and fine sand. Levee breaching introduced bed load material into the new channel, forming the crossbedded gravels and sands.

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POSTDEPOSITIONAL REACTIONS INVOLVING BORON, SEDIMENT, AND PORE WATER IN MISSISSIPPI DELTA SYSTEM

The boron concentration in the clay fraction of argillaceous sediments has been used for several years as an index to paleosalinity. Although experimental studies have shown that adsorption is the initial uptake reaction between clay and solution, basic questions have remained concerning the permanent fixation of boron in a clay mineral, and other possible diagenetic effects. The present study considered that question in the light of data obtained from sediment and expressed porewater from shallow cores taken from various parts of the Mississippi Delta system.

Clays entering the Gulf of Mexico from the Mississippi River adsorb boron from seawater while the clays are still in suspension. After burial, this initially adsorbed boron is fixed by the clay, and additional boron is adsorbed from the interstitial pore-water. Very soon after burial, considerable boron may be released from organic matter in the sediment (perhaps due to microbiological decomposition), causing an early enrichment of boron in the porewater. This boron, however, is also adsorbed by the clay minerals in time.

Contrary to the conclusions reached by others, these data indicate that late diagenetic enrichment is not required to explain the boron content of deeply buried Gulf Coast shales.