biologically productive eastern boundary current regimes. The differences between these regions, in terms of topography, climate, surface and subsurface water mass influence, and ecosystem productivity, are expressed in the modern sediment records.

Paleogeographic and paleo-oceanographic evidence indicates that at least some of the factors that influence modern deposition must have found similar expression in the Monterey. Perhaps workers familiar with the laminated sediment facies of the Monterey will recognize a range of stratigraphic features that are contained in the core samples collected from the modern deposits.

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Geology and Reservoir Distribution, Pinda Formation, Offshore Zaire and Southern Offshore Cabinda

The Albian-Cenomanian Pinda Formation of offshore Zaire and Cabinda is composed of mixed carbonates and siliciclastics deposited in a transgressive sequence of supratidal, intertidal, and subtidal facies. The Pinda overlies Aptian salts of the Loeme Formation and is unconformably overlain by calcareous shales of the Iabe Formation.

The supratidal sediments were probably deposited on sabkhas, in coastal playas, and by intermittent streams. Intertidal environments included offshore bars, tidal flats, tidal channels, and restricted lagoons. Shallow-water subtidal sediments accumulated on a broad, gently sloping ramp on which a few isolated shoals developed.

A series of north-northwest-trending growth faults, active during and after Pinda deposition, have affected the thickness and attitude of Pinda rocks, influenced the distribution of secondary dolomite, and created both productive and prospective structures.

Pinda reservoirs are primarily dolomites with intercrystalline, moldic and vug porosity, and sandstones with intergranular porosity. Less important are lime packstones and grainstones with interparticle porosity. Facies, dolomitization, distance from source area, and growth faulting control the occurrence and quality of Pinda reservoirs. Thicker, more prospective reservoirs exist on the eastern part of the shelf, where coarser siliciclastics accumulated closer to their source and secondary dolomitization occurred. Production rates in Pinda fields of offshore Zaire reflect the differences between reservoir characteristics in the eastern and western shelf areas.

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Integrated Stratigraphic and Seismic Approaches to Reservoir Mapping, Mibale Field, Offshore Zaire

Located on a north-northwest-trending growth fault block on the continental shelf of offshore Zaire, the Mibale field produces medium grade oil from the Cretaceous Pinda Formation and is sealed by calcareous shales of the overlying Iabe Formation. An integrated geologic-geophysical study of the field resulted in detailed characterization and mapping of the Pinda reservoir, from which locations for future development and water injection wells have been selected.

The Albian-Cenomanian carbonates and terrigenous clastics of offshore Zaire form a transgressive sequence comprised of landward thickening supratidal and intertidal deposits, and seaward thickening subtidal deposits. In the Mibale field major lithofacies are: (1) supratidal—thick-bedded sandstones and dolomites, with minor shales and anhydrites; (2) intertidal—thin-bedded shales, dolomites, and sandstones with minor anhydrites; and (3) subtidal—(a) thick-bedded dolomites and sandstones; (b) dolomites; and (c) lime wackestones to packstones containing various skeletal and non-skeletal grains.

Cores show that the sandstones and dolomites have better permeabilities than the limestones. The areal distribution of permeable reservoirs is controlled by facies configuration, growth-fault movements, and secondary dolomitization. Within a single facies, thickness variations greater than 300 ft (91 m) occur.

Because of the unpredictable thickness variations, seismic inversions (pseudo-sonic logs) were used to define the subsurface configuration of depositional and diagenetic facies across the field. Inversions were carefully calibrated to sonic logs and used for direct interpretation of lithology in areas lacking well control. Structure and gross pay maps, as well as lithologic and petrophysical characteristics of reservoir facies, enabled engineers to develop a three-dimensional simulation model of the field.

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Mineralogy and Pore Fluid Geochemistry of Great Salt Lake, Utah

Piston cores from the South Arm of Great Salt Lake, Utah, have been analyzed chemically and mineralogically. The major detrital minerals are quartz and clay minerals (illite, smectite, mixed layers, and minor kaolinite) with lesser amounts of feldspars and volcanic ash (both felsic and basaltic). Carbonate minerals include aragonite, calcite (0 to 15% $MgCO_3$), high-Mg calcite (50% $MgCO_3$), and dolomite. The carbonate minerals reflect detrital input as well as authigenic growth in the lake. Saline minerals are halite, mirabilite, and gypsum.

Pore fluids were extracted from 7 piston cores and subjected to wet chemical analyses. The major ion profiles are similar and cut time-stratigraphic units of the cores indicating little influence from primary formation waters. Instead, compositions are controlled primarily by fluctuations in lake water compositions and mineral reactions. Major ion concentrations are determined by mass transport from the lake waters and from the most soluble minerals present in the sediment. Presence or absence of halite influences Cl^- profiles, while SO_4^{2-} is largely controlled by mirabilite dissolution. Because mirabilite and halite solubilities are nearly equal in Great Salt Lake brines, Na^+ is affected by both phases. Gypsum is present; however, because of the much higher solubility of mirabilite, the effect of gypsum on SO_4^{2-} is obscured, while Ca^{2+} responds to gypsum. The effects of carbonate mineral reactions are not apparent in the Ca^{2+} profiles. Because of the relatively small carbonate alkalinity with respect to other weak bases, reactions involving carbonate minerals are difficult to identify.

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Late Pleistocene and Holocene Sedimentary History of Great Salt Lake, Utah