tion—the ability to see small features.

Resolution, both vertical and horizontal, depends on the seismic bandwidth. Obviously, this requires high frequencies. There is also value in the low frequencies, particularly to the geologist using pseudo-logs or searching for gradual transitions of rock properties.

First steps to improve the bandwidth involve deconvolution in association with good field technique, good field discipline, and additional processing. These improvements are inexpensive, but limited. Thereafter, we depend on improvements in the source; these improvements begin to increase the cost significantly.

In explosive work, improvements can be made by manipulating the charge size, the depth, and the ghost reflection; many small charges and a few large charges may be combined in the CDP technique.

The Vibroseis system does more; it allows us to precompensate the seismic signal for any expected attentuation. In principle, we can raise any frequency above the noise merely by transmitting it for a longer time. However, desirable increases of bandwidth can increase the cost of the field work by several times. There is no limit to the bandwidth we can achieve, but bandwidth is expensive. Delineation wells (and certainly dry holes) are even more expensive. We must find a new balance of cost-effectiveness.

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Glacial Lithofacies of Neogene Yakataga Formation, Gulf of Alaska

Lithofacies, biofacies, and chronostratigraphic analyses indicate three relatively warm and three relatively cool paleoclimatic intervals within the 5,000-m thick strata of the lower Miocene through Holocene Yakataga Formation of the Robinson Mountains, eastern Gulf of Alaska. Glacial periods, recognized by the predominance of glacial lithofacies associated with populations of *Neoglobigerina pachyderma* s.l., are interpreted for the cool intervals. In the sections studied, the interglacial intervals have little or no glacial deposits.

Yakataga Formation strata of glacial origin can be classified as having formed in either ice-contact or glacial-aqueous depositional environments. Ice-contact deposits consist of stratified or chaotic sedimentary materials, but erratics are rare in the Yakataga Formation. Glacial-aqueous deposits are of three principal types: glaciolacustrine, glaciofluvial, and glaciomarine. Glaciolacustrine deposits have not been identified in the Yakataga Formation. Glaciofluvial deposits, characterized by interbedded poorly sorted lenticular sand and gravel, occur in geographically limited and stratigraphically restricted intervals of the Yakataga Formation. Glaciomarine silts and clays, containing floating pebbles and cobbles and insitu marine fossils, are the dominant glacial aqueous deposits in the Yakataga Formation. Detailed lithofacies associations and geometries define open-shelf and fjord glaciomarine subenvironments. Lithofacies sequences within these subenvironments suggest deposition by advancing and retreating ice masses.

Mapping of the relative percentages of lithofacies types within the late Pliocene-Pleistocene glacial sequence defines the late Neogene paleogeography of the Yakataga district. This mapping suggests that the late Pliocene and Pleistocene distribution of alpine glaciers, coastal-outwash and alluvial flood plains, and fjords, and the associated rates of sedimentation, are analogous to the depositional pattern during the Holocene.

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Models for Formation of Organic-Rich Diatomaceous Laminae in Miocene Monterey Formation: Documentation from Analogous Recent Sediments in Gulf of California

Depositional modeling of the Monterey Formation has traditionally focused on basin scale models. Analysis of homogeneous and laminated, organic- and diatom-rich sediments from the central Gulf of California permits modeling of small-scale depositional environments that may be useful in mapping within the Monterey Formation.

Sedimentologic, micropaleontologic, and geochemical characteristics of recent Gulf of California sediments permit definition of three depositional environments.

(1) *Thick* (~1 cm) lamination of the silled anoxic San Pedro Martir Basin. The laminae are indistinct in color and contain a uniformly mixed opal phytoplankton population of both oceanic and upwelling floras. Only the darker laminae contain the silt- and clay-sized material washed into the area during the rainy season.

(2) *Thin* (~1 mm) lamination of slope sediments where the oxygen minimum zone impinges the sea floor (~400 to 1,300 m water depth) on both the Baja and mainland sides of the Guaymas Basin Slope. Laminae are generally distinct in color and consist of alternating oceanic and upwelling opal phytoplankton assemblages. Dark laminae contain clay- and silt-sized terrigenous material. Dark laminae on the Baja side also contain an upwelling microfloral assemblage. Dark laminae on the mainland side contain an oceanic microfloral assemblage.

(3) Homogeneous sediments overlie laminated sediments off Santa Rosalia. The homogeneous sediments are characterized by uniformly distributed microfloral and macrofloral elements and terrigeneous material due to bioturbation by a mollusk infauna.

The differences between the various laminated and the nonlaminated (= homogeneous-bioturbated) facies are due to differing levels of primary productivity in surface waters which in turn controls oxygen consumption. Oxygenated bottom water underlies low primary productivity areas while anoxic bottom water underlies high primary productivity areas.

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Supply of Sediment to Oceans: Climate and Eustatic Sea Level Changes and Interregional Unconformities

The completeness of the deep-sea stratigraphic record depends upon the balance between sediment supply from biogenic surface production and delivery of detrital sediment across continental margins, and sediment removal by mechanical erosion and/or chemical dissolution. These parameters, in turn, are controlled by a combination of interrelated changes in global sea level, climate, and oceanography. Studies of the rates and patterns of accumulation of both biogenic and detrital sediment in the deep sea, based largely on data from DSDP drill holes, demonstrate that no single factor determines trends in deep-sea sedimentation.

It is tempting to link the global patterns of rise and fall of