ventional base map sources, each of which may show accurate internal spacial distribution, but be inaccurately located relative to the true coordinate geometry of the earth.

Problems ensue when attempts are made to display various data from different sources. Wells, leases, seismic, etc, may not be properly located with respect to each other or with respect to the digital base used.

One solution is to store the digital base in conventional coordinates and locate all other data as offsets to known points in the digital base such as the closest section corner. this is an adaption of the so-called "Legal Description" that is used to locate wells. Pseudo-"Legal Descriptions" can be computer-calculated where not directly available. Boundary data can be treated as a series of connected points that can accurately overlie the digital base map data. Compatibility for all data thus located is achieved regardless of the source or digital base from which the data is acquired. Revisions of the digital base do not require re-registration of other data.

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Terrestrial Influence and Bioturbation Effects on Composition of Organic Matter in Middle Cretaceous Shale and Limestone Sequence near Pueblo, Colorado

Soluble organic matter (chloroform), pyrolytic hydrocarbon yield (Rock-Eval), and carbon isotope ratios of insoluble organic matter were determined on core samples of the Hartland Shale and overlying Bridgecreek Limestone of the Greenhorn Formation. Trends in the organic geochemistry correlate with clay mineral content and sedimentary structures of the sediment, suggesting that (1) terrestrial input and (2) bioturbation are dominant influences on the composition of preserved organic matter.

(1) The Hartland clay shales are organic matter-rich (organic carbon contents 2.3 to 4.5%) but have lower ratios of pyrolytic hydrocarbon yield- and extractable hydrocarbons-to-organic carbon, and lower kerogen $\delta^{13}C$ values (from -27 to -28 ppt) than the Bridgecreek calcareous shales (organic carbon contents 1.8 to 5.4% and $\delta^{13}C$ values from -24.5 to -26.2 ppt. The laminated Hartland shales contain abundant terrestrial detritus (up to 70% quartz, illite, and mixed-layer clays). The laminated to partly bioturbated Bridgecreek shales contain minor terrestrial detritus (less than 20%), indicating a reduction in terrestrial influence on the basin after deposition of the Hartland clay shales.

(2) Within the Bridgecreek member, the types of organic matter preserved in the laminated calcareous shales, partly bioturbated calcareous shales and bioturbated limestones are different, and are thought to result from increasing bioturbation and availability of oxygen in the bottom water. As bioturbation increases, the organic matter remains isotopically constant, but decreases (from about 5 to less than 1%) and is altered chemically as shown by decreasing ratios of pyrolytic hydrocarbon yield- and extractable hydrocarbons-to-organic carbon, and increasing ratios of pyrolytic carbon dioxide to organic carbon.

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Micropaleontologic Analysis of Navarin Basin, Bering Sea, Alaska

Navarin basin, a large structural basin filled in places with more than 12,000 m of sediment, underlies the Bering Sea continental shelf about 100 km from the Koryak coast, U.S.S.R. The shelf in this region is relatively flat with a pronounced shelf-slope break at about 200 m. In contrast, the continental slope is incised by three large canyons.

Little is known about the sediment and microbiota in the Navarin basin province because preveious work in the Bering Sea has been concentrated in the eastern and southern areas. More than 100 gravity cores and grab samples were collected during the summer of 1980 from the basin, adjacent slope, and nearby canyons in water depths ranging from about 80 to 3,300 m. Cores as long as 6 m contain predominantly clastic mud and sand. This preliminary U.S. Geological Survey sampling program is the first attempt in the Navarin province in which the three microorganism groups—diatoms, radiolarians, and foraminifers—are used to obtain paleogeographic information and to establish age-datum planes.

Diatoms, the most abundant micro-organisms in the cores, are useful for defining glacial events and sea level fluctuations, and for establishing depth of deposition. Radiolarians are more abundant in the deeper shelf area, and are used to delineate paleogeographical boundaries and biostratigraphic events in the Navarin province. Calcareous foraminifers are abundant in the cores from even the deepest stations, but diversity is low. Shallow-water benthic foraminifers recovered in deep water indicate downslope movement of sediment. Study of these three micro-organism groups provides a more complete picture of the benthic and planktonic communities and thereby leads to a more accurate paleoecologic interpretation of Navarin basin.

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Melones μ: Clay Controlled, Inclined Oil-Water Contact Reservoir, Orinoco Heavy Oil Belt

The Melones μ reservoir is the topmost petroleum bearing sand of the Melones Field, which is located in the Eastern Venezuela basin, within the Orinoco heavy oil belt.

This huge reservoir contains 1.5 billion bbl of 8.2 to 10.3° API oil in situ. It is a shallow reservoir (1,900 ft or 579 m deep) and has an average thickness of 80 ft (24 m). The unconsolidated sand, with a dip of approximately 1°, contains variable amounts of dispered clay. The μ-sand is a stratigraphic accumulation which has an updip closure controlled by an increase in its clay content. The clastics of this unit were deposited in an alluvial meander belt environment.

Even though the oil-water contact of this giant accumulation is inclined, the reservoir is under hydrostatic conditions. The inclination of the contact is controlled by the sands' clay content. It is postulated that during migration the oil and water had similar densities resulting in the inability of the oil to displace the water except in clay-free areas. The low dip of the strata also did not aid the oil migration.

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Holocene and Ancient Hardgrounds: Petrographic Comparison

Subtle diastems or truncation surfaces in carbonate sequences can go unnoticed during core inspection when mineralized coatings or encrusting fauna are absent. These