debouching in Corpus Christi Bay. It has been theorized that the Neuces River once flowed southeasterly crossing northwest Webb and central Duval Counties and then into Baffin Bay.

A subsurface stratigraphic study was initiated to determine the existence of stacked fluvial sequences within the confines of the proposed former course of the Neuces River. Four hundred and three electric logs were examined to determine the formation tops, bottoms, thickness, percent sand, net sand, and maximum sand of both the Oakville and Catahoula Formations.

The electric log data were reduced to acceptable form for use with the University of Rhode Island SYMAP program. The SYMAP program is capable of producing a map of any dimension using a conventional line printer. Data base, cross section location, percent sand, net sand, and maximum sand maps were produced by this method. An advanced University of Rhode Island program known as SYMVU was used in conjunction with a CalComp plotter to display the data as a colored, graphic, three-dimensional map.

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Submarine Diagenesis (Aragonite Dissolution, Cementation by Calcite, and Dolomitization) in Ordovician Galena Group, Upper Mississippi Valley

The Galena Group is a fossiliferous, dominantly carbonate unit about 85 m thick, which was deposited in a broad epeiric sea mostly below wave base.

Submarine dissolution of aragonite and cementation by calcite appear to have proceeded simultaneously in Galena sediments. Commonly, the enclosing sediment (mostly carbonate mud) lithified before shell aragonite dissolved, resulting in moldic voids. Most of these voids were later cemented with block calcite spar; some were filled by bioturbation.

Some burrow fills became lithified but the enclosing matrix remained soft. Where this occurred, sparry replacements of aragonitic bioclasts now exist only within these burrow fills; lithification preserved bioclast outlines. Where scouring later exhumed lithified burrow fills, they produced topographic highs on scoured surfaces or intraclasts with meniscus-fill fabric.

Hardgrounds very commonly occur in most exposures of the Galena; many are bored. Sparry calcite fills cracks in some hardgrounds, and is transected by borings or by the overlying bed. Spar-filled voids suggestive of former aragonitic clasts are preserved in the upper centimeters beneath hardgrounds in some strata which otherwise lack these fossils.

Fine to very fine crystalline dolomite fills burrows extending downward from many hardgrounds. Individual dolomite crystals are abraded at scoured surfaces and at margins of intraclasts. These features suggest that dolomitization occurred on the seafloor.

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Anoxic Environments and Oil Source Beds

The anoxic, aquatic environment is a mass of water so depleted in oxygen that virtually all aerobic biologic activity has ceased. Oxygen demand relates to surface biologic productivity, while oxygen supply largely depends on water circulation, which is governed by global climatic patterns and the Coriolis force.

Organic matter in sediments below anoxic water is commonly more abundant and more lipid-rich than under oxic water mainly because of the absence of benthic scavenging and bioturbation. Geochemical and sedimentologic evidence suggests that oil source beds are and have been deposited in four main anoxic settings.

1. Large anoxic lakes. Permanent stratification promotes development of anoxic bottom water, particularly in lakes not subject to seasonal overturn such as Lake Tanganyika. Warm, equable, paleoclimatic conditions favored lacustrine anoxic settings.

2. Anoxic silled basins. Only those landlocked silled basins with positive water balance tend to become anoxic. Typical are the Baltic and Black Seas. In arid region seas, such as the Red Sea and the Mediterranean Sea, evaporation exceeds river inflow, causing negative water balance and well-oxygenated bottom waters. Hence, silled basins do not necessarily imply the presence of oil source beds.

3. Anoxic layers caused by upwelling. These develop when the oxygen supply in deep water cannot match demand due to high surface biologic productivity. Examples are the Benguela current and Peru upwellings. No systematic correlation exists between upwelling and anoxic conditions because deep oxygen supply can commonly match strongest demand. Anoxic sediments resulting from upwelling are found preferentially at low paleolatitudes.

4. Open-ocean anoxic layers. These are found in the oxygen-minimum layers of the Pacific and northern Indian Oceans, far from deep, oxygenated, polar water sources. They are analogous to worldwide "oceanic anoxic events" during global climatic warm-ups and major transgressions, as in Late Jurassic and middle Cretaceous times.

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Use of Trace Fossils for Interpretation of Triassic Depositional Environments, Northeast Border of French Massif, Central France

A variety of trace fossils occur in Triassic sediments of the northeast border area of the French massif as follows:

1. Vertebrate tracks: numerous species (approx. 30) that point to the existence of: (a) numerous large herbivorous reptiles (*Isochirotherium*) accompanied by small ones (*Rhynchosauroïdes, Rotodactylus*); rare carnivorous reptiles of relatively small size (*Coelurosaurichnus, Sphingopus, Anchisauripus*); common omnivorous or necrophagous reptiles (*Brachychirotherium*); (b) very small insectivorous or herbivorous reptiles or amphibians (small *Rhynchosauroïdes, Prolophonichnium, Platipes, Furcapes*).

2. Invertebrate trace fossils: *Isopodichnus, Planolites, Cochlichnus.*

3. Plant imprints: *Voltzia* sp.

4. Associated primary sedimentary structures: ripple